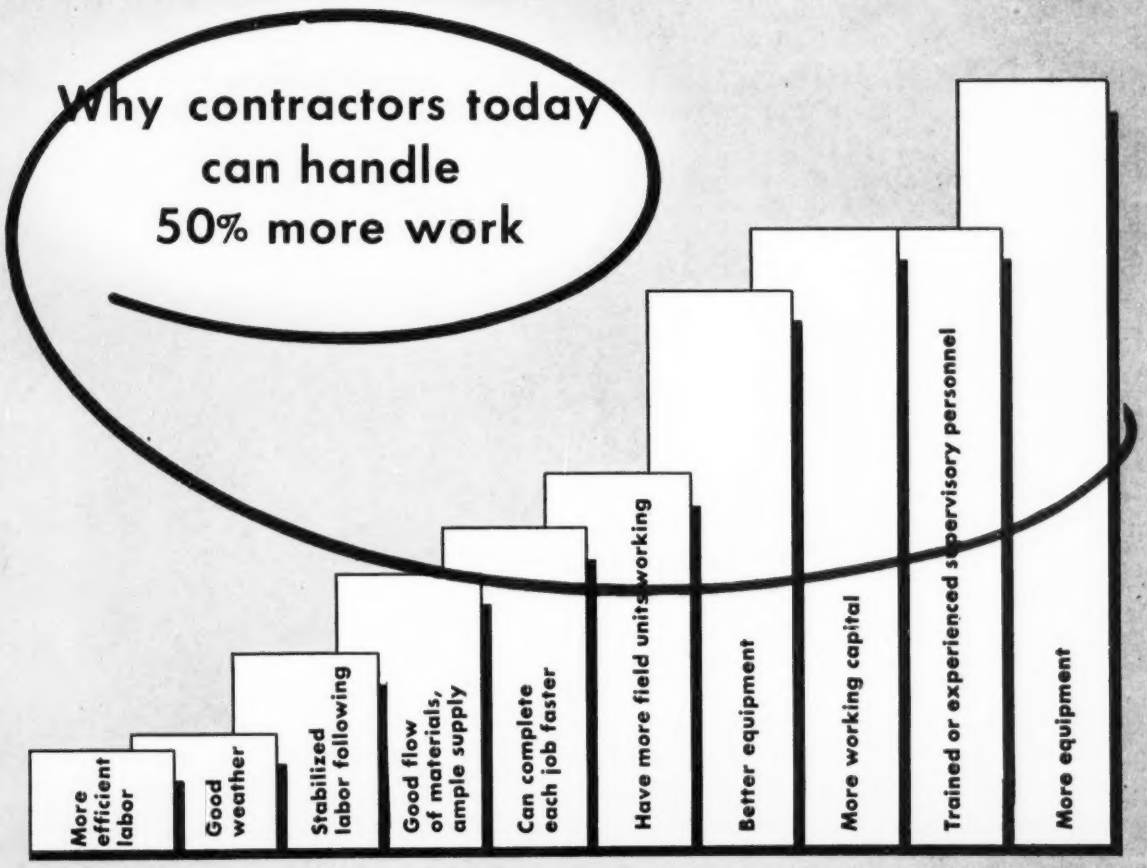
ENGINEERING NEWS-RECORD

An ENR special report


Why contractors today can handle 50% more work
More efficient labor
Good weather
Stabilized labor following
Good flow of materials, ample supply
Can complete each job faster
Have more field units working
Better equipment
More working capital
Trained or experienced supervisory personnel
More equipment

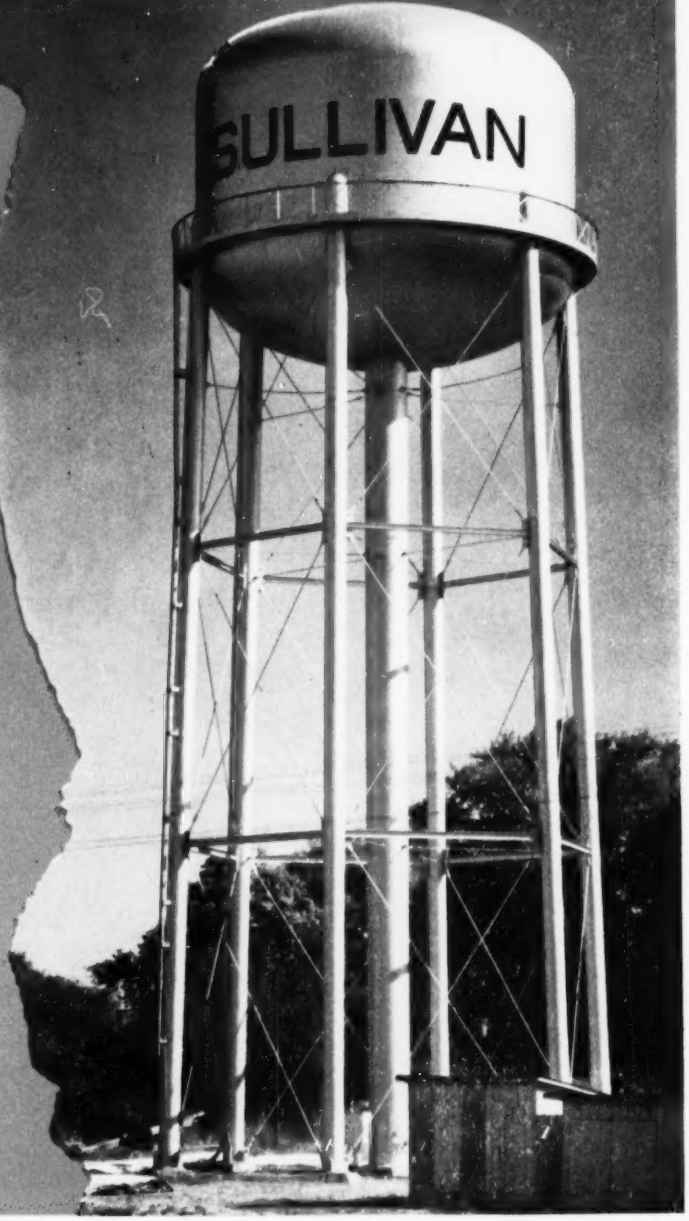
A McGRAW-HILL PUBLICATION

Here's SULLIVAN'S Answer for Better Water Service...

A 200,000-gal. Horton* elevated tank and a new pumping plant were installed to improve municipal water service at Sullivan, Ill. The system serves 1,200 customers including six industrial plants. Average daily consumption of water is 500,000 gals.

During the erection of the Horton elevated tank, a Field Welding Supervisor was assigned to the job to check welding personnel, be sure that welding equipment was working properly and inspect and grade test plugs. It was his job to make sure that the tank was built in accordance with specifications set forth in the plans drawn by Warren & Van Praag of Decatur, Ill., the Consulting Engineers on the project. Field Welding Supervisory service is standard procedure on all Chicago Bridge & Iron Company field-erected installations to assure you of the best possible structure. It is yours at no extra cost.

Write our nearest office for estimates or quotations on Horton elevated water tanks for improving municipal water service. There is no obligation on your part.



*Registered in U. S. Patent Office

200,000-gal. Horton ellipsoidal-bottom elevated tank recently erected at Sullivan, Illinois.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3	2125 Healey Building	Detroit 26	1506 Lafayette Building	Philadelphia, 3	1623—1700 Walnut St. Building
Birmingham, 1	1530 North 56th Street	Havana	402 Abreu Building	Pittsburgh, 19	3212 Alcoa Building
Boston, 1	1913—201 Devonshire Street	Houston, 2	2100 C & I Life Building	San Francisco, 4	1530—2000 Bush Street
Chicago, 4	3101 McCormick Building	Los Angeles, 17	1311 General Petroleum Building	Seattle, 1	1312 Henry Building
Cleveland, 15	2201 Midland Building	New York, 6	3311—165 Broadway Building	Tulsa, 3	1617 Hunt Building

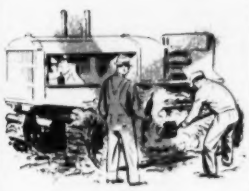
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.

Advance design features make

Allis-Chalmers Tractors performance leaders

IT takes truly modern equipment to keep pace with today's stepped-up demands — and do it at an operating cost which insures fair and consistent profits. The line of Allis-Chalmers crawler tractors has been designed and built completely new since the war, with the kind of advanced engineering that delivers big-capacity performance at a minimum of maintenance expense.

This forward progress is a continuing program. Additional improvements are constantly being incorporated into the HD-5, HD-9, HD-15 and HD-20 tractors. If you are in the market or just interested, see your Allis-Chalmers dealer for all the inside facts that have proved so popular with owners as well as operators and mechanics.

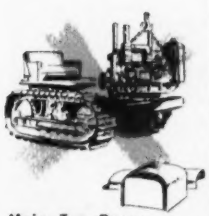


Daily Lubrication

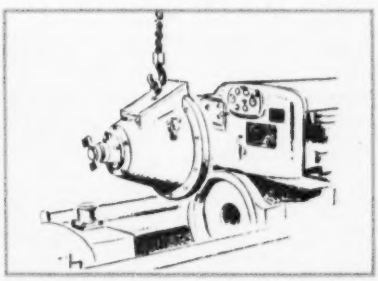
1000-hour Lubrication. Operate six months on a 40-hour week basis with just one lubrication of truck wheels, front idlers and support rollers. Positive seals protect from dust, loose sand, soft ground, mud or water. You gain working time, save labor and lubricant costs, eliminate costly damage from greasing neglect.

Ordinary Steering Clutches

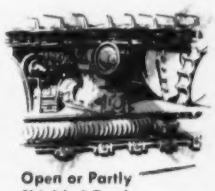
Hydraulic Steering and Self-Energizing Brakes. The HD-15 and HD-20 have hydraulic booster steering; operator exerts only 3 to 5 lb. pressure on controls, so he gets small tractor maneuverability from these 27,850 and 41,000 crawlers. Self-energizing brakes need less pedal pressure, take hold with a firm, uniform grip.



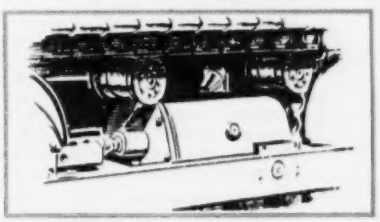
Major Tear-Down



Unit Servicing. No need to remove transmission or engine, radiator, grille, etc., when servicing or removing an Allis-Chalmers master clutch. The unit assembly principle also applies to final drive gear, transmission, steering clutches, engine and truck frame. Save hours of costly service and down time.

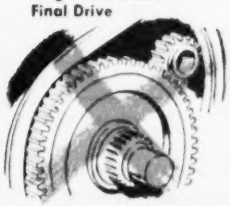


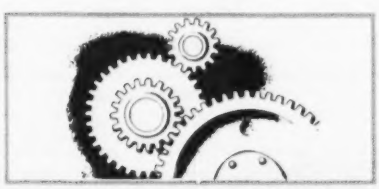
Open or Partly Shielded Track Release Mechanism



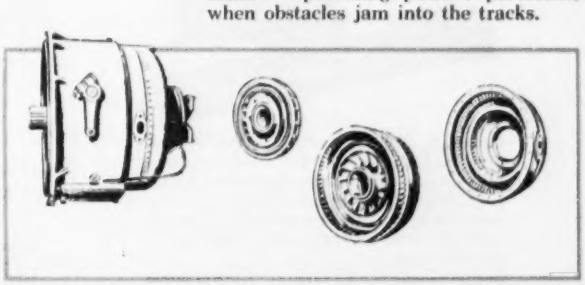
Oil Enclosed Track Release Mechanism. Operating in oil and *sealed* against dirt and moisture, Allis-Chalmers track release mechanism seals out mud, ice and debris. Because it's completely sealed, release mechanism is in working condition at all times — providing positive protection when obstacles jam into the tracks.

Single Reduction Final Drive





Double Reduction Final Drive. With smaller gears and shorter shafts, double reduction final drives provide better bearing and gear alignment. The "live" axle permits smaller, more serviceable seals. Equally important, double reduction drive provides for smooth, clean bottom construction and the extra ground clearance so necessary on rough terrain.



Hydraulic Torque Converter Drive. The HD-20 is the only crawler tractor where torque converter is standard equipment and part of the basic design. Torque converter gives greater pay load capacity because this unit automatically balances travel speed to the load. And with most shifting eliminated, there's far less operator fatigue.

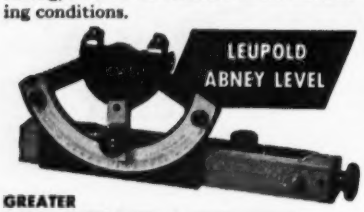
ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

ORIGINATOR OF THE TORQUE CONVERTER TRACTOR

for greater
CONVENIENCE
and
ACCURACY

LEUPOLD
Engineered
LEVELS

Advanced design engineering and precision manufacturing techniques have earned world-wide acclaim for LEUPOLD instruments since 1907. Exclusive LEUPOLD features...dependable LEUPOLD accuracy are your assurance of time-saving, trouble-free service under all working conditions.



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Exclusive LEUPOLD design holds scales in milled slide, ready for immediate use without removing and reversing the frame ...saves time and trouble on all jobs. Bubble magnifier adjusts internally to the user's eye. No draw eyepiece to retract for carrying...no re-focusing each time instrument is used. New improved micrometer adjustment on index arm gives easier, faster and more accurate readings.

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Overall Length.....6½ inches
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Comes in saddle leather case with belt loop
MODEL A (Choice of any 2 scales)....$27.50
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Compact, lightweight instrument for all preliminary leveling work. Measures only 5¼" in overall length. Exclusive LEUPOLD bubble magnifier adjusts internally to user's eye...brighter bubble eliminates eyestrain and permits faster, more accurate readings.

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Robert F. Boger
Publisher

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Low-cost transportation since 1928!

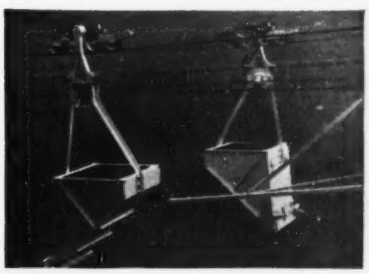
Tasa Coal Company Morgantown, West Va.

This 3,412-foot bicable tramway has been in continual operation for more than 25 years. It carries 200 tons of coal per hour at low ton-mile cost, giving dependable all-weather service.

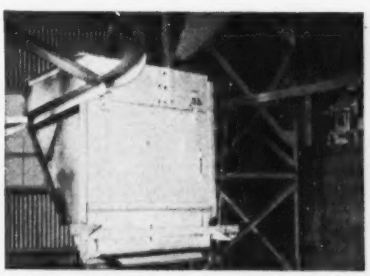
It spans a river in one 1500-ft. jump, crosses a public highway and a high tension line on the way from loading terminal to discharge hopper.

The 62 cu. ft. end-dump buckets load and unload automatically... discharging into a terminal bin at the rate of one every 26 seconds.

This aerial tramway was designed by the Tramway Division of United States Steel. The job included designing and furnishing cables, mechanical buckets, electrical equipment—and supplying all of the steel required.



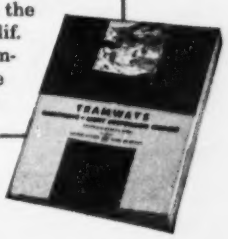
Conveying materials for a few hundred feet or for several miles, Columbia-Geneva Tramways can be built to handle from 1½ to more than 300 tons hourly. They can be designed to meet almost every type of operating condition, and to handle many kinds of commodities easily and economically—from a tray of optical lenses to a carload of lumber.



Load carriers, like this one on a bicable tramway, are available in many different types and sizes. Services of Columbia-Geneva's Tramway Division include designing the tramway...supplying the steel...excavating for foundations and erecting support structures...furnishing and installing all wire rope, cables, and electrical and mechanical parts.

Tramway support structures are of many types, depending on terrain and job. Because of this flexibility, tramways are free of ground contour, roads, railroads, etc., are unhampered by bad weather, and can climb extremely steep grades. Other advantages: loads can be moved without rehandling and rights-of-way are easier to acquire.

Send for this free manual on aerial tramways. Write on your letterhead today to the Tramway Division, Columbia-Geneva Steel, 141 Battery St., San Francisco 6, Calif. Or for an expert study of your transportation needs, ask for the services of a Tramway Engineer. He can show how an aerial tramway would pay off for you, and he can contract for its design and all phases of its construction, including materials.



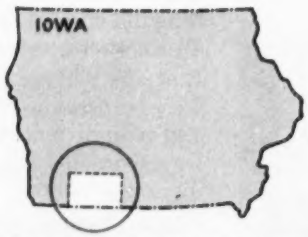
Tramway Division

Columbia-Geneva Steel

Division United States Steel Corporation, San Francisco

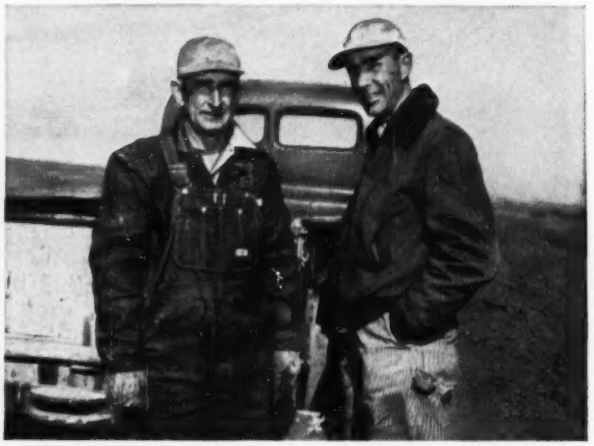
UNITED STATES STEEL

Taking Iowa



RINGGOLD COUNTY has 935 miles of county roads. This is the location of farm to market road construction done by the International Crawler fleet of Easter & Schroeder, Inc.

Pick Your Site and Set Your Hour...
We'll Demonstrate Our Tractor's Power



"IDEAL FOR FARM-TO-MARKET ROAD CONSTRUCTION," say Joe Easter and Don Schroeder (above). "In our eight month's working season, our five TD-18A units, with the sixth as a pusher, moved approximately 540,000 cubic yards, with minimum downtime."

ROAD BUILDING PRODUCTION LINE! Part of the Easter & Schroeder fleet of International crawlers on a regrading job in Ringgold County, Iowa. On this seven-mile stretch they moved 78,000 cubic yards in three weeks' time. *"We move it that way all the time,"* say the owners.

to Town

Farm-to-market roads get big boost fast from the International Crawler fleet of Easter & Schroeder, Inc.

The dirt flies when Easter & Schroeder, Inc., move in with their fast, powerful fleet of International crawlers . . . and Iowans can get to town and back in time to do the milking. For these Griswold, Iowa, contractors specialize in farm-to-market roads in the tall corn state.

Take the seven-mile job in Ringgold County, Iowa, you see here. In three weeks' time, Easter and Schroeder moved 78,000 cubic yards of dirt to give the road a 24-foot top on a 66-foot right of way.

Easter and Schroeder came to this Ringgold County job from one in Taylor County, where they moved 35,000 cubic yards of dirt on a two-mile stretch, completing the job in six 11-hour days.

"After 25-years' experience working in dirt, we settled on a crawler fleet one hundred per cent International," say these contractor partners. The fleet now consists of six International TD-18As with scrapers and 'dozers and a TD-14A with tamping roller.

Do you want speed and dependable economy under tough conditions? Then get in touch with your International Industrial Distributor, for all the facts on Power that Pays!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

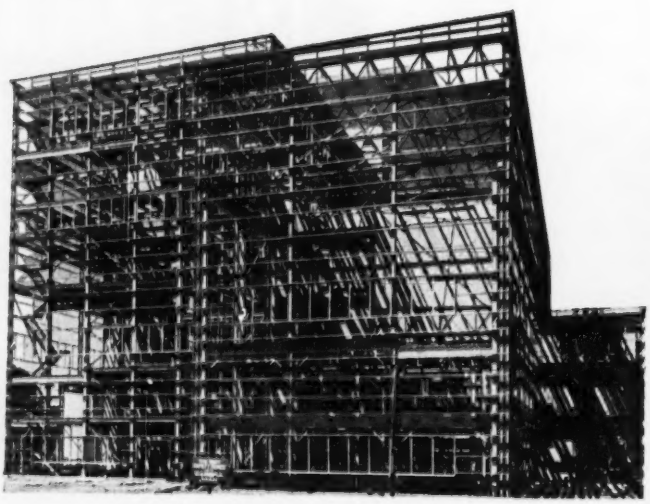
POWER THAT PAYS

INTERNATIONAL

INTERNATIONAL HARVESTER

SEVEN GREAT INTERNATIONAL CRAWLERS...EACH WITH MATCHED EQUIPMENT FOR EVERY JOB

fabricating steel is our business! with five strategically located fabricating plants, we can do the job quickly and economically.



Unit No. 2, Plant Sweatt, Mississippi Power Company. Meridian, Miss. Ingalls fabricated and erected both Units 1 and 2.

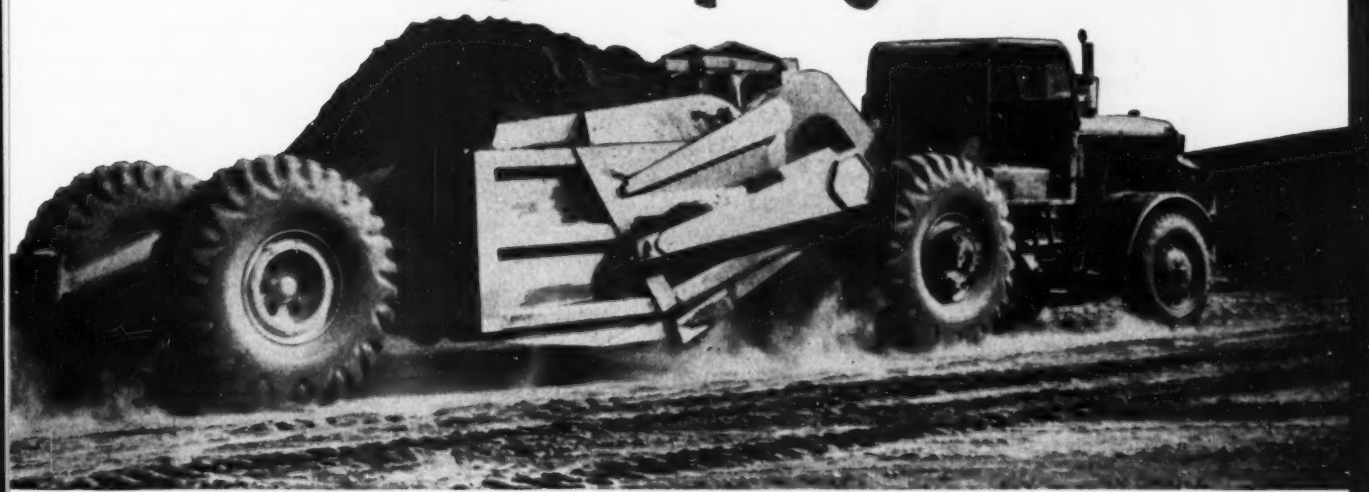
THE INGALLS IRON WORKS COMPANY

BIRMINGHAM, ALABAMA

Sales Offices: New York, Chicago, Pittsburgh and Houston

Plants: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.

How big is a scraper payload?



Because there are several ways to figure equipment capacity, it's mighty important that payload ratings are compared on the same basis. For example, if you use the struck figure for one unit and the heaped capacity for others in making a production estimate, the result can mean an unprofitable bid and higher costs per yard moved.

And heaped capacity ratings can be misleading too, because just how high is a heap? Some manufacturers use a heaped figure based on a 1:1 slope while others prefer a more conservative and practical rating of 3:1 slope. Heaped loads can vary by several cubic yards depending on the material, method of loading and hauling conditions. For example, the Euclid Scraper carries 15.5 cu. yds. with a level load, 18 cu. yds. with load heaped to 3:1 slope and 21 cu. yds. at 1:1 slope.

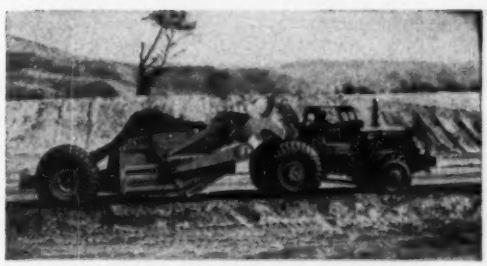
When you're in the market for scrapers to supplement or replace your present equipment, be sure to check struck capacity and other specifications such as engine horsepower, loaded travel speed, scraper operating controls and hourly cost and production data.

How big is a scraper payload? You can't tell how much dirt is in the bowl just by looking—it's the pounds of pay dirt that tell the story. By actual scale weight, "Eucs" carry more pounds of payload than scrapers of comparable size because the design of the low, wide bowl provides good loading action and exceptional compaction.

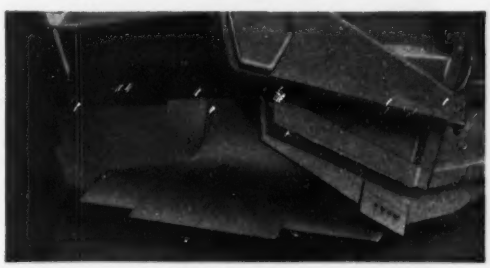
You'll find there are good reasons why "Euc" scrapers outperform all others of comparable size. A Euclid distributor near you will be glad to supply all the facts—without any obligation, of course.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

Cable address: YUKLID **Code: BENTLEY**



LEVER ACTION is an exclusive Euclid development that eliminates all but 13 ft. of cable . . . no more cable replacement expense or down time due to cable breakage. All four hydraulic hoists that operate bowl, apron and ejector are interchangeable.



CUTTING BLADE consists of 4 sections, each interchangeable and reversible. This Euclid design permits easy adjustment to provide blade arrangements that are most efficient for loading any type of material from loose sand and top soil to heavy clay and shale.

EUCLID THE PIONEER

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

9% MORE OUTPUT

By saving 15 to 25 seconds every time it dumps, Koehring heavy-duty Dumptor earns an important increase in yards hauled per hour. For example: At 16 trips an hour on a typical 1000-foot one way haul, saving an average of 20 seconds every cycle gives you 5.3 minutes more productive haul-time . . . and adds 9% to hourly yardage output.

There is no waiting for slow-acting body hoists. With Koehring gravity dump it takes just one second to dump a full 6-yard load. Operator trips the body release lever, and gravity instantly tilts the scoop-shaped body 70° . . . one second later the body is empty, and Dumptor is on its way back for another load.

You get this same one-second dumping even in sub-zero weather because gravity dump never balks . . . never wears out. And you don't lose time or spend money on expensive hoist maintenance or costly replacement parts because Koehring Dumptors have no body hoists.

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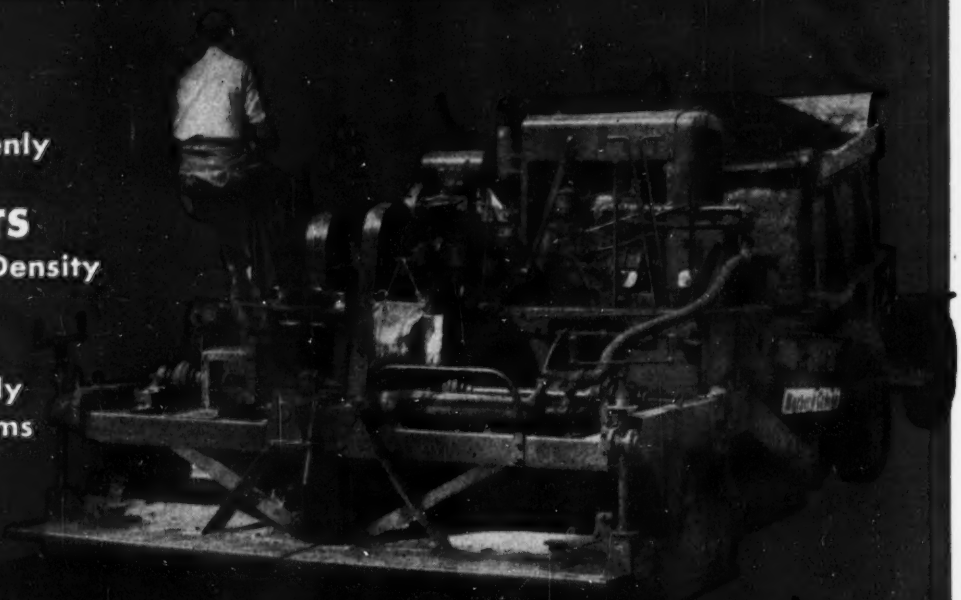

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READER COMMENT

Airbases abroad

SIR: Your article on the possibilities for U. S. airbases in Spain (ENR May 14, 1953, p.33) is presented in a most lucid, logical and authoritative style, and should warrant a great deal of attention from the profession.

ALFRED HEDEFINE, *Partner*
Parsons, Brinckerhoff, Hall & Macdonald
Consulting Engineers,
New York, N. Y.

SIR: I have just finished reading your most interesting article "JCA—new command post for military construction in France" (ENR June 11, 1953, p.33). It was a very clear and factual description of the organization and problems of JCA, and I wish to offer you my congratulations upon an excellent piece of work.

GEORGE F. FERRIS, *President*
Raymond Concrete Pile Co.
New York, N. Y.

SIR: Your very fine article on JCA has subjected me to a certain amount of good natured kidding because of your comment in regard to Nold. From my viewpoint, of course, the article would have been improved if these remarks had been minimized. Nevertheless, personnel in this office feel that the article is quite accurate and tells the story of JCA in very clear-cut and understandable fashion.

G. J. NOLD
Major General, U.S.A.
Director, Joint Construction Agency
Paris, France

SIR: That was really a fine review on the French airbases. A lot of fellows in this organization were not aware of what was going on until they read your article.

ELWYN E. SEELYE
Seelye, Stevenson, Value & Knecht
Consulting Engineers,
New York, N. Y.

New specification justified

SIR: I have read with interest the editorial, "Implications of a new specification," (ENR July 16, p. 180), on the matter of carbon steel for welded structures. Having followed this matter quite closely since early in 1952, at which time government engineers took a leading part in asking that carbon steel, in the form of both plates and shapes, for welding, be defined more accurately than is done in ASTM A7-50 T, I would like to present a few comments toward clarification.

There would be no need for changes in A7 if welding were confined to thicknesses in the vicinity of one inch or less and welding operations were confined to shop procedures or field operations under extremely favorable conditions. The fact remains, however, that steel plates and shapes in thicknesses up to four inches and field welds under adverse conditions are actualities.

Although thin-flanged members of A7 carbon steel may be expected to have, under most conditions of manufacture, physical and chemical properties complying with the criteria proposed for the new standard, there is grave doubt that this will hold for the thicker sections. If physical properties, such as a yield point of 33,000 psi minimum, as now stipulated in A7-50 T, are maintained in the new standard, it seems reasonable to believe that ductility and bending criteria cannot be maintained by the use of carbon alone. Thus, other alloys are implied, and the new standard becomes jutified —with no reflection on the A7 Standard so long in popular use and acceptance for riveted connections.

With physical and chemical properties of the steel for welding (both bridges and buildings) adequately and completely defined, the way seems open for the promulgation of codes of practice for welding, written around such a steel. Economies claimed for welded structures over those having other types of joints are probably closer at hand due to the proposed new standard and appropriate action regarding completion of revised editions of codes of practice for welding.

It is believed these comments may be helpful in explaining the oftenheard complaint that government engineers require added assurances of safety or higher safety factors than engineers in private practice. When the new standards are available, whether in revisions to A7-50 T (two types of steel), a new standard of ASTM, or in the form of a new or revised federal specification, it is believed a controversy of many years standing will have been clarified through a practical approach by competent and experienced engineers.

RALPH R. BRITTON
Special Assistant to the Secretary of Defense for Engineering Standards & Criteria
Washington, D. C.

(Reader Comment continued on page 15)

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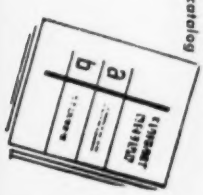

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THE ENGINEER'S REPORT

DATA

LUBRICANT RPM Tractor Roller Lubricant

UNIT Track bearings — Caterpillar D-8

CONDITIONS Building roads to oil wells—side-hill operation, grit, sand

PERIOD 5,000 hours

FIRM Bennett Murray, Inc. Newhall, Calif.

Track-roller bearings go 5000 hrs. in tough work!

WORKING IN MUD, GRIT, AND SAND, a D-8 Caterpillar like this, lubricated with RPM Tractor Roller Lubricant, went 5000 hours without replacement of a single track bearing; during its two years of operation in all kinds of service, only the tracks were changed. Eight D-8's are used by Bennett Murray, Inc., Newhall, Calif., to build roads into oil well locations. Despite much steep, side-hill work—and the fact that they sometimes operate in oil sumps full of chemicals—these dozers all get between 2500 and 5000 hours on a set of track-roller bearings.

MAKING A CUT THROUGH A HILL is typical of the rugged work Bennett Murray equipment does in many parts of Southern California. Track bearings on all of their bulldozers are greased regularly with RPM Tractor Roller Lubricant.

REMARKS: There are three grades of RPM Tractor Roller Lubricant—Light, Medium, and Heavy—to meet all climatic and operating conditions in Caterpillar track-roller bearings. For Allis-Chalmers, RPM Tractor Roller Lubricant—A. C. Type is recommended.

RPM

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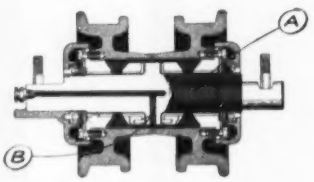
How RPM Tractor Roller Lubricant resists wear in the toughest service



It flows evenly to all bearing surfaces, lubricates and retards rust formation.

A. Contains chemical anti-wear agent—maintains tough lubricating film.

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READER COMMENT

Safety demonstration

SIR: Your publication could render an invaluable service to mankind by more and more safety articles.

I have read with great interest the article on Safety by J. W. Kovach on Page 39 of the July 9, 1953. However, the front piece of this issue shows a crane hoisting a platform with a man riding the platform.

Anyone, who has been trained in safety, knows that this is a flagrant violation of safety rules and such a practice would not be allowed on a construction job where safety and well-being of their workmen comes first. This thought is more or less borne out in your article as mentioned above.

To a young engineer or an inexperienced construction supervisor or workmen or any construction man where safety is not placed first, this picture indicates that such a practice is an accepted construction method. It will take much effort and many safety posters to erase from his mind the thought that a man riding a platform is not an accepted method for performing this task.

T. O. RICE
Field Project Manager
Engineering Dept.
E. I. DuPont de Nemours & Co.

CALENDAR

Joint meeting International Association for Hydraulic Research and Hydraulics Division of the American Society of Civil Engineers, University of Minnesota, Minneapolis, Sept. 1-4.

American Concrete Pipe Association, annual short course school of instruction, Sherman Hotel, Chicago, Ill., Sept. 10-12.

American Institute of Parks Executives, Denver, Colo., Sept. 13-18.

National technical conference on lighting, Illuminating Engineering Society, Hotel Commodore, N. Y., Sept. 14-17.

American Concrete Pipe Association, executive committee, Castti Harbour Hotel, Bermuda, Sept. 19-30.

National highway conference of county officials, American Road Builders Association, Lake Delton, Wis., Sept. 24-25.

National Electrical Industries Show, 69th Regiment Armory, New York City, Sept. 29-Oct. 2.

Southeastern Association of State Highway Officials, annual meeting, Asheville, N. C., Sept. 30-Oct. 3.

Conferences on Radiant Heating, Department of Architecture, Pratt Institute, Brooklyn, N. Y., Tuesday evenings, 7:30 to 9:30 p.m., October-November.

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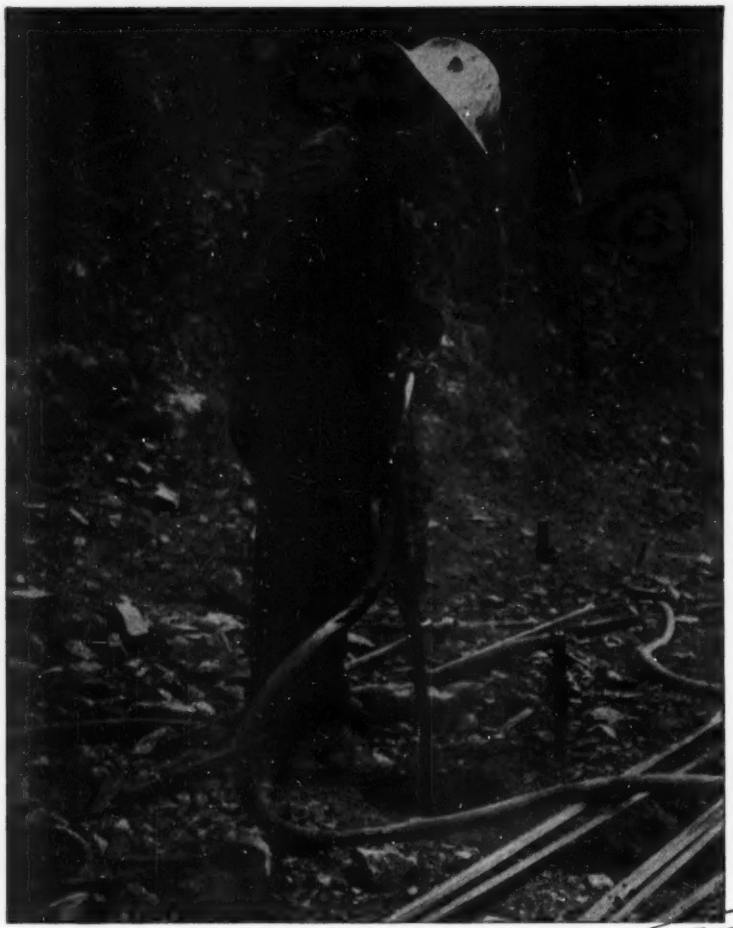

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Cadmium plating prevents rusting of JOY Silver Streak Rock Drills and spare parts while in use or in storage. In addition, the plating forms cadmium oxide under frictional heat and pressure. This so effectively acts as a lubricant that the inner parts will not score, *even if regular lubrication is temporarily neglected!* In addition to assuring a smooth "run-in," cadmium plating allows closer tolerance of precision fitting parts—vital factors in the power and long life of the drill.

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THE CONSTRUCTION WEEK

- **Bridge site out of sight?**—San Franciscans, long in turmoil over plans for a southern crossing of San Francisco Bay, had something new to speculate on:

  A construction firm (Charles L. Harney, Inc.) had bought—for a reported $250,000—a 40-acre plot on Candlestick Point that has been considered publicly as a terminus for the proposed new bridge.

  Harney officials hastened to head off comment with a statement that the land had been bought as a source of fill and for possible redevelopment as a housing project. It was bought, said Harney, "without any reference whatsoever" to possible location of a highway bridge at Candlestick Point or anywhere else.

- **Caution note**—There's a sober side to those fairly rosy reports by the Federal Reserve Board of a continuing strong demand for housing (see page 151 for details). The sober side is this: The survey questionnaire is sent out early in the year, takes nearly six months to tabulate; there's no guarantee, admits FRB, that people who say they'd like to buy actually will do so.

  But, over the last several years, FRB notes happily that actual sales tended to follow survey trend.

- **Information section**—Oregon's highway commission is going into the movie business—as a means of letting taxpayers know what's being done with $72 million they authorized for an emergency postwar construction program. Star: the Portland-Salem expressway route.

- **Bobtail pike**—Local folks in Florida are already nicknaming the projected turnpike from Miami to Stuart a "Bobtail" pike. It was originally planned to run to the Georgia State line—but nobody's apparently worried about paying for it.

- **No bond trouble if**—The Florida State Turnpike Authority was told by a group of 68 southern banking houses that, if engineering reports on the 110-mi route authorized by the legislature are satisfactory, there'll be no trouble selling bonds to pay for construction.

  Three engineering firms are now making detailed studies of the route, construction and financial possibilities.

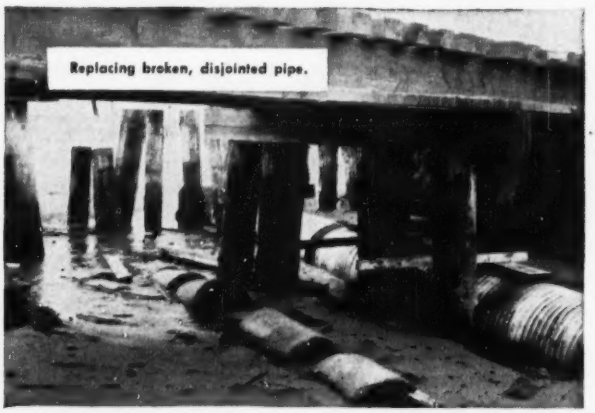
- **Weather outlook**—Here's the 30-day forecast for mid-August to mid-September, to be read with the tables printed under the heading "The Weather" on page 57 of this issue:

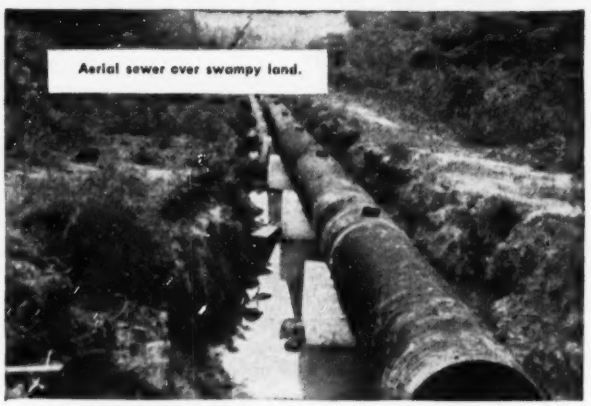
  Temperatures will average below normal in the Southeast, Northern Plains and Great Basin; above normal in the Northeast, Southwest and Gulf Coast, elsewhere, not far from normal.

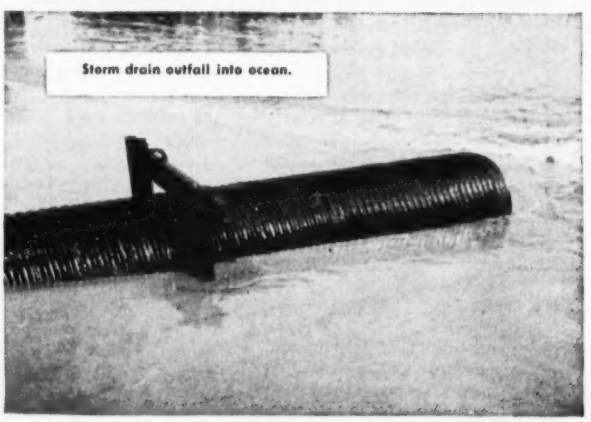
  Rainfall expected to exceed normal in Northern Plains, Upper Lakes, Southern Plateau and Atlantic Coast. Subnormal along the West Coast, and from Texas northeastward to lakes, in a broad band through lower Mississippi and Ohio valleys. Elsewhere, near normal.

Make Firm Sewer Bids On Unstable Foundations

In watery airport subgrade.


Replacing broken, disjointed pipe.


Aerial sewer over swampy land.


Storm drain outfall into ocean.

Why do contractors like Armco Sewers? Because they are integral conduits? Because they combine strength with light weight and flexibility? Yes, all these reasons help—but the *low installed cost* of Armco Corrugated Metal Pipe is the convincing factor for difficult sewer applications.

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Armco Sewer Structures

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WASHINGTON OBSERVER

New order from Eisenhower to reduce spending puts on pressure to hold down costs on federal construction (see page 26). It applies across-the-board—to every agency in the government, military and civilian. Biggest chunks of savings are in military and such areas as reclamation and public power. But other federal bureaus also will be following the order by cutting back on personnel and reducing activities wherever possible.

•

Idea is to expand the budget cutting begun on new 1954 budget. For example, new law authorizing $490-million of new projects for 1954 was tightened up this way: Spending at any one station can only go five percent over amount authorized—and military has to offset any increase by equal savings in other projects. Before this, military were permitted a ten percent increase, which is still permitted for overseas projects.

Since big cuts come hard, such corner-cutting all around will be stepped up in order to make an economy showing. Eisenhower and his new team are under heavy political pressure to make this showing in the 1955 budget—which is the first one that's their very own. The 1954 budget they largely inherited from the Truman regime.

•

A "czar" to decide jurisdictional disputes among AFL unions is being pushed by the building trades unions. The idea went before the AFL executive council in Chicago, and AFL president Meany promises some kind of jurisdictional machinery will be put before the AFL convention in St. Louis in the fall.

Competition from other AFL unions is the big gripe the carpenters had when they walked out. (See page 31.) The czar idea is similar to the CIO's organizational umpire system, headed up by Nathan Feinsinger, former chairman of the Wage Stabilization Board.

•

The new contract compliance committee is a major Eisenhower step in the civil rights field. He's restoring pretty much the system Truman had requiring fair employment—non-discrimination—in defense contracts. Simply put, you are not eligible for any kind of government contract if you or the unions you deal with have any "no Negro" or other discriminatory practices.

•

Korean reconstruction is aimed at building an industrial unit in the Northwest. The major prospects:

- **A nitrogen fixing plant** for fertilizer in the Kangwan province.
- **A multipurpose dam on the Hawchon river,** along with some small steam plants.
- **Dredging the Han river** will be undertaken to let ocean-going ships bring in construction materials from Inchon.
- **Expansion of iron and tungsten mining.**
- **Some construction will be done at fishing ports,** including canning and refrigeration facilities.

•

Only preliminary planning has been done so far—and any real activity won't start for some time. Food and medical supplies are the first shipments to Korea; but construction will be a part of the approximately $1-billion, four-year program being considered. Syngman Rhee wants to deal with the U. S., so considerable amount of business will be placed here.

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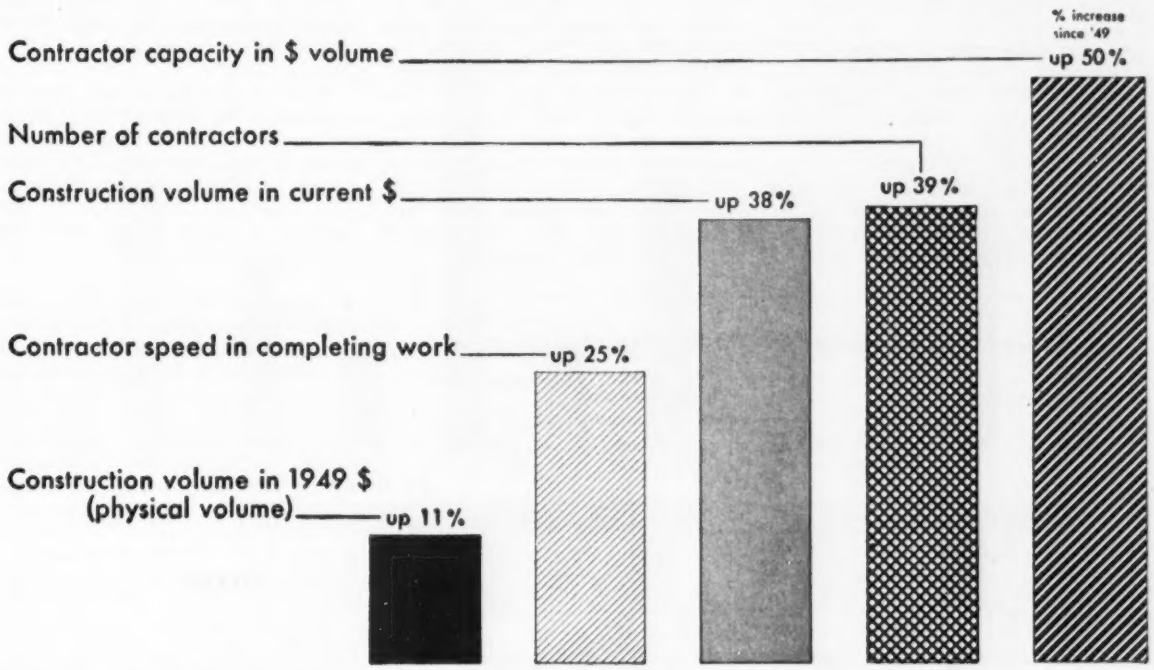


Contractor capacity tops volume

ENR survey indicates key factors in 50% expansion are equipment, working capital and supervisory personnel

Heavy construction contractors today can handle 50% more work than in 1949, according to a measurement of capacity taken by ENR. Though volume of work is at an all-time high, it gained only 38% in the three-year period.

So, it's no wonder contractors are bidding for jobs with an aggressiveness not experienced in 20 years or more. A majority of the 600 contractors responding to ENR's capacity check-up see this intense competition lasting another year or two, and resulting in a "separation of the men from the boys."

For one thing, they say the prevalence of unsound bidding is bound to cause a number of the weaker, marginal operators to drop out. In an attempt to hang on, some of these firms are bidding jobs at very little or no profit margin and sometimes at figures below the actual costs of competing contractors.

All firms, however, will be put on their mettle during this period of readjustment as it has become apparent that even the most solid enterprises must figure their profit margin close to win a job. The premium will be on sound management as never before.

• **More work and faster**—Of the contractors responding to ENR's survey questionnaire, 82% reported an increase in capacity as measured in terms of dollar volume. (These contractors were listed by ENR as taking on $100,000 or more in heavy non-building construction in 1952.) Nearly all could handle more jobs and larger jobs. Some 69% reported they could complete projects faster—a median increase in speed of 25%.

A 39% increase since 1949 in the number of contractors listed by ENR as doing $100,000 or more business annually has to be considered, along with findings on increased capacity.

Among the several factors responsible for increased capacity, contractors rated four most prominently:

- More equipment.
- Good supervisory personnel.
- More working capital.
- Better equipment.

Equipment plays the most vital role. Eighty percent of the contractors singled out additional equipment as enhancing their ability to take more work. Better equipment was listed as a contributing factor by 54% of the respondents.

The quality of their trained and experienced supervisory personnel was credited with contributing to increased capacity by 63% of the contractors. By the same token, 8% listed the lack of well-qualified supervisory personnel as definitely limiting their expansion. Improved supervisors have played an equal part in the growth of all contractors, regardless of size.

Having more working capital was an aid to increased capacity, according to 63% of the contractors reporting. Only 4% claimed to have been hampered by insufficient cash resources.

Additional field units were reported as a factor in increased capacity by 37% of the contractors. This type of expansion was most common in the $500,000 to $1,000,000 classification, with 78% rating it as a vital factor. Among contractors doing $1,000,000 or more annually the figure was 42%. As expected, the smaller contractors, those doing less than $500,000 per year, had expanded less

Contractor capacity tops volume

in this respect, but 33% did report they owed part of their expansion to added field units.

• **Labor and engineer shortage**—While 21% of the contractors listed a more stabilized labor force as contributing to their increased capacity, 19% reported a shortage of labor as hampering their ability to expand.

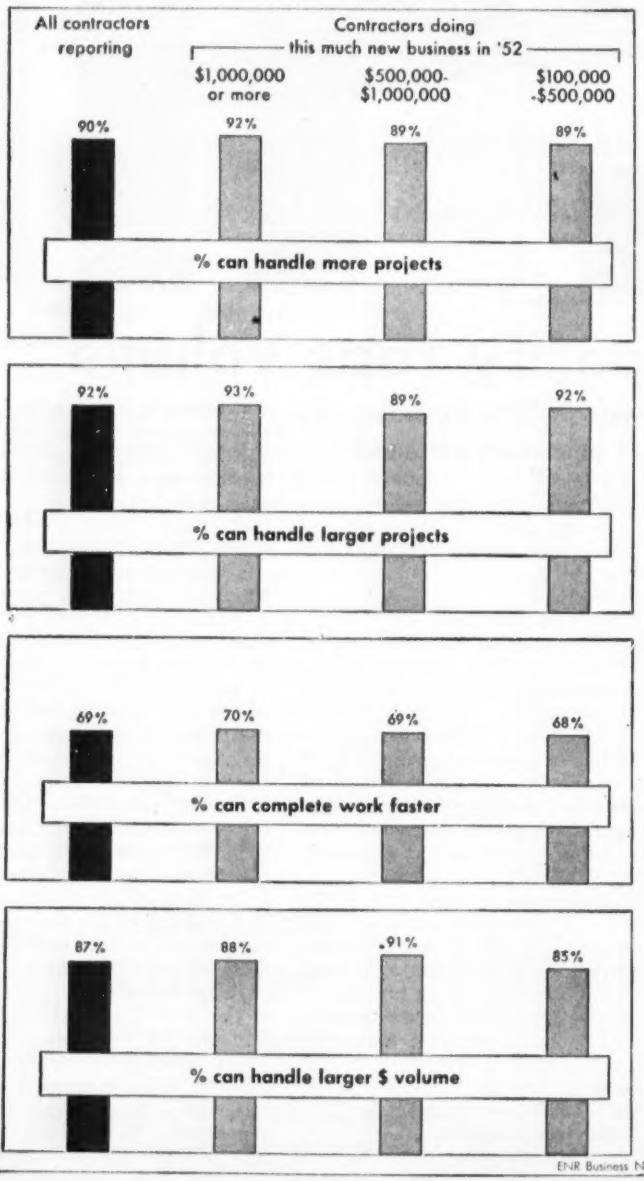
However, it is noteworthy that labor shortage was more of a handicap to the medium and small firms than to the large contractors. Only 13% of the contractors in the $1,000,000 and over class, reported trouble from this cause. About 20% of the medium and smaller size contractors reported labor shortages limited their expansion.

Contractors in the Middle Atlantic and Midwest areas appear hardest hit by a shortage of labor. Atomic energy plant construction and related power projects are making a heavy drain on labor in some Midwest areas. And, of course, there are regions where high industrial wages make recruiting of construction labor difficult.

Greater efficiency of labor is rated as partly responsible for greater capacity by 15% of the medium and smaller contractors. But, only 7% of the larger firms rated this as a favorable element.

Shortage of engineers was listed as a handicap by 16% of the contractors. Out of the Middle Atlantic group of firms reporting, 23% mentioned their need for more engineers. The count was about 15% for the rest of the country, except in the Far West where it was 11%.

Increased capacity '49-'53 by size of contractor



ENR Business News

• **Number of bidders up 25%**—Contractors of every size and classification are running into heavy competition in bidding. Of those reporting on ENR's capacity survey, 82% said they were encountering an average of 25% more bidders per job than a year ago. Ninety percent declared they had to bid on more jobs to land a contract.

One thing certain is that estimates are being studied mighty hard before going out as bids. The spread between the low and high bid is surprisingly thin when legitimate bidding prevails.

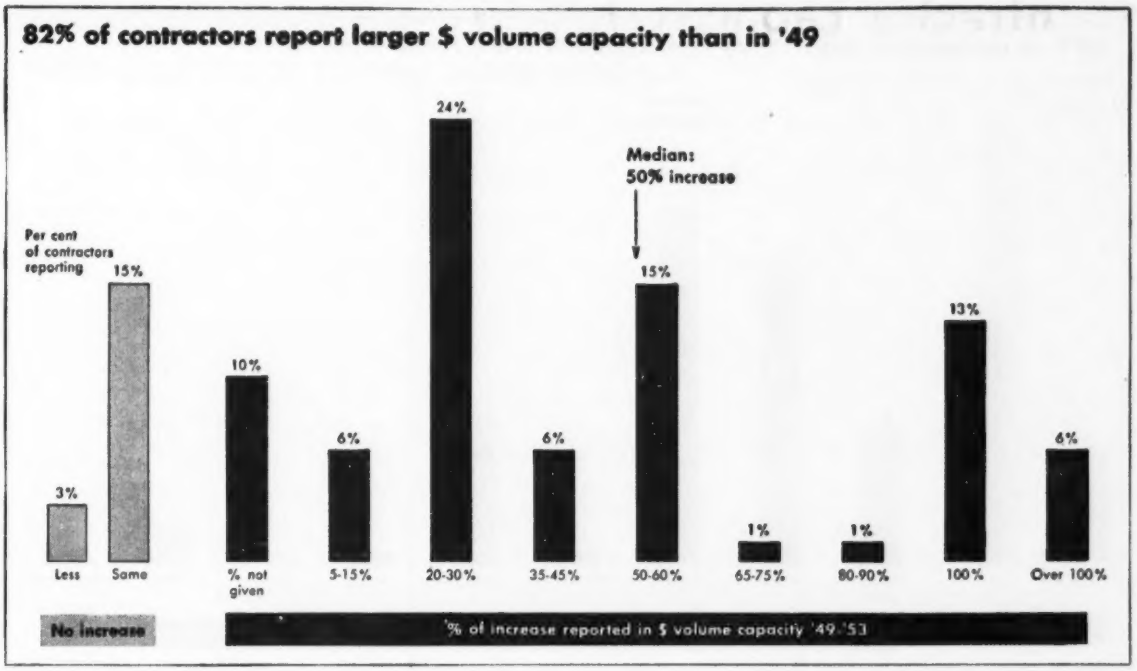
Virtually all firms recognize now that they must be prepared to accept a somewhat reduced profit margin to get a job.

The trouble is, bemoans an Indiana contractor, "Keener competition is causing lower bid prices at a time when higher prices are more justified."

"Practically every contractor I know has doubled his capacity for doing work in the last two years," says Richard E. Quinn, president of Quinn Construction Co., Inc., Kansas City, Mo. "In our area, the backlog of work is smaller than it has been since the war and contractors will continue bidding low-margin jobs in an effort to keep their organizations intact."

V. R. Howell, president of the Howell Asphalt Co. of Mattoon, Ill., sizes the situation up this way: "It appears that contractors are slightly top heavy with personnel and equipment and are now bidding to get a volume to carry this excessive overhead, with resulting low margins. To survive this period of adjustment, it will be necessary to improve the efficiency of operators far beyond that point reached during the rather lush years in the construction industry immediately preceding the 1953 season."

In states where highway work is at low ebb, road contractors have experienced some real jolts. Take this case in Minnesota, cited by H. B. Phelps, president of the St. Paul Dredging Co., St. Paul. "Some county-state aid road projects have been bid as low as 11 cents per cu yd. It can't be done



and even pay cost of labor and repairs."

A curtailed highway program in Iowa has created a similar situation. "Road grading work in this state is going for cost or lower this year," reports Daniel Ostermann of Gus Ostermann & Sons of Ocheyeden. "As an example, we did work last year at 25 cents per yard, whereas this year the same work is going for 14 and 15 cents."

• **Highway bid price indexes**—The composite mile price index just posted by the Bureau of Public Roads offers striking evidence of how competition is forcing lower bid prices on highway work. It shows a 4.5% average drop in bid prices since the first quarter of this year. Second quarter index is 158.5, compared to the all-time high of 165.9 in the first quarter (average bid prices in the 5-year period, 1925-29, represent 100 on the BPR index).

Average bid prices declined in the second quarter for all types of highway work covered by the index. Largest drop was in structural steel, down 6.2%. Other notable declines were in concrete pavement, 5.8%, and in structural concrete, 4.2%. Common excavation bid prices dropped 2.4% and there was a minor 0.8% dip in the average bid price of bar reinforcing. Drops in structural steel and reinforcing, however, would not have reflected the steel price increase that became effective June 17.

A 13% increase in the number of contractors qualified to bid on California highway jobs is one of the chief factors responsible for a further drop in this state's highway bid price index. The index dropped by 3.5% in the first quarter of this year and 0.4% below this in the second quarter. It has steadily declined since reaching a new high back in the fourth quarter of '51, except for a temporary minor gain in the last quarter of '52.

As of June 30, there were 691 contractors pre-qualified to bid on California road jobs amounting to $50,000 as compared to 611 a year ago. The number of contractors pre-qualified to bid on jobs costing between $250,000 and $1,000,000 is 481, up 15% from a year ago.

Compared to 1949, the number of qualified bidders is up 9% for jobs over $50,000. But, the number able to bid on jobs of $1,000,000 or more is up 47%. The number of bidders per highway job has gone up sharply. In June, jobs were attracting an average of six bidders or 25% more than a year ago.

• **Seeking new fields**—Helping to intensify bidding competition is a growing tendency for contractors to seek work in a wider geographical area. Some 47% of the contractors replying to this survey, for example, are seeing if the grass is greener in someone else's backyard. Tendency to bid in a wider area was common to both large and small contractors.

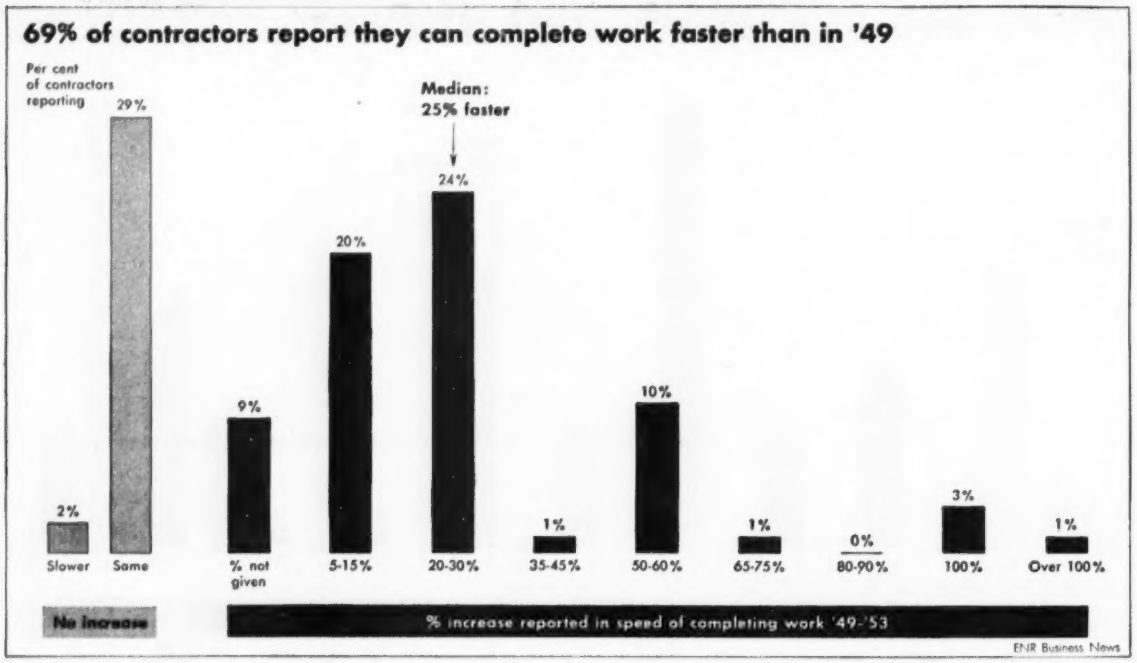
Then, too, you find competition intensified by contractors bidding outside their accustomed line of work. In Pennsylvania, for example, coal strippers who are having a poor market in the anthracite fields are bidding on highway jobs.

It is apparent that more contractors are trying for volume as a means of compensating for low margins of profit. And, of course, those operating under this philosophy are bidding on more jobs and they're bidding low.

"Good competition is still grouped within an understandable price range, but this range is usually 10% to 20% above the low bidder," notes contractor Martin J. Kelly of Jamaica Plain, Mass.

Old hands in the business seem to be taking the rough competition in stride and even somewhat philosophically. For example, an Oklahoma contractor has this to say about his operations: "With increased competition, we find ourselves prone to juggle our known costs on previous jobs with the alibi that 'this work is a little simpler' or 'with the experience on that job, we can better our costs 10%.' We see the results in that we know our net for this year will be less. However, we must use these methods to be low bidder on a job now and then. . . . Many firms will be liquidated in the next two years. However, those that emerge will be the strong ones, and that perhaps is as it should be."

Speaking of the keen competition encountered in power and telephone line construction, George M. Ingram of De Kalb Contracting Co., Decatur, Ga., has this observation to make: "The answer to survival is careful planning in bidding for a small profit, using good equipment and good super-



visory personnel. Keep overhead costs as low as practicable."

A few voices can be heard welcoming the challenge of current competition, though, no doubt, they speak in terms of legitimate or realistic bidding. They cite such advantageous effects as reducing costs and promoting efficiency.

• **Unrealistic bidding**—The prevalence of unrealistic bidding is what has contractors most concerned about today's situation. E. H. Kemp, president of the Dixie Construction Co., Savannah, Ga., describes an experience that has become commonplace when he says: "Ninety percent of the jobs we bid go at prices as much as 15% below our estimated cost. About 25% of the work is going to new contractors who have gone into business in the last two years."

Experienced contractors can't help but feel that a good many of today's low bidders are flirting with bankruptcy. For one thing, it is recognized that many jobs are being bid without allowance for contingencies such as bad weather and labor troubles. Even overhead costs seem to be forgotten by today's overanxious bidders.

It is understandable, therefore, why many contractors are warning of the possibility of a heavy business casualty list in the next couple of years. Past experience, they point out, indicates that failures will be inevitable among firms operating on slim cash resources and those heavily burdened by equipment obligations made under easy credit terms.

As could be expected, most of the "hungry" biding that's going on is attributed to new, inexperienced operators, including the so-called "war babies."

"I have been in business for 30 years and have seen this condition four times before," says W. J. Noonan, Pensacola contractor. "They (the weaker, marginal operators) go broke and then the legitimate contractors go ahead."

• **Experience will count**—Experience and a good cash position are going to be key factors in the critical period ahead. "The honeymoon is over and only properly managed, equipped and financed firms will meet up with the present situation," wisely cautions a Fort Wayne, Ind., contractor.

"The organizations which can afford to wait out this period should be able to continue to bid and obtain jobs with a legitimate profit included in their bid," concludes M. M. Hochberg, vice-president of Leslie Elson Co. of Chicago.

Above all, as one contractor puts it, "This is the time for contractors to keep their heads."

While most contractors are looking forward to a year or more of the toughest competition they've faced since long before the war, the fact that there is still plenty of new business around and more in the offing should not be lost sight of at this time.

The dollar value of contracts for heavy construction projects (other than buildings) in the first 33 weeks of this year amounted to $3.5 billion—a 26% gain over the similar period of '52.

Volume of proposed work shows an even greater increase. Proposed projects as reported to ENR in the first seven months of this year were valued at $3.7 billion—a healthy increase of 30% over the same period last year.

There are good gains over a year ago in the flow of new work of all types, except earthwork, waterways and the category termed "public unclassified." The brake on federal expenditures accounts primarily for the lag in these three categories.

Biggest gain in the volume of proposed new work this year is the $301 million in bridges, representing a 139% increase in the value of projects that went into the backlog in the corresponding period last year.

Highway construction shows the next highest gain, with projects estimated to cost over $1 billion proposed in the first seven months of this year. That's 65% more than entered the backlog over the similar period in '52.

The $172 million in proposed new waterworks projects represents a 13% increase in the seven months' backlog over last year. Backlog of sewer projects rose to $303 million—a 29% gain.

Daniel B. Neiderlander, president of John W. Cowper Inc., Buffalo, N. Y., seems to have a point when he says: "A lot of people get the impression that we're going to have a recession but there's nothing in the construction industry to indicate that." He adds, however, that he thinks, "A substantial portion of the work available is in specialized public works jobs, notably schools and highways."

Bureau of Reclamation reshuffling seen following quick survey team probe

A reshuffling of both the organization and operations of the Bureau of Reclamation is expected to result from the findings of a survey team now investigating the agency.

The five-man team, appointed earlier this month by Interior Secretary Douglas McKay, was given these responsibilities:

- To determine whether the agency is carrying out only legally assigned duties, or has assumed additional duties acquired through "wishful thinking."
- To decide whether the agency is performing its legally assigned functions in the most economical and effective manner.
- Recommend scope of bureau activities required under existing law.
- Recommend organizational changes that would improve efficiency and economy.

Deadline of Oct. 1 has been set for submission of the report. This would appear to offer little time for the task, but the team has a big advantage in that three of the five members already are intimately acquainted with bureau organization and operations.

• **Experienced group**—E. A. Moritz, chairman of the group, and R. J. Newell are both retired regional directors of the bureau. Between them they have had more than 62 years of active service.

Moritz retired last August as director of the Pacific Southwest Region of the bureau with headquarters at Boulder City, Nev. Newell retired in June 1949, as Columbia Basin regional director with headquarters at Boise, Idaho.

George Abbott, technical assistant on the House Interior and Insular Affairs Committee, has kept a close eye on bureau activities from his legislative post on Capitol Hill.

A fourth team member, John G. Marr, was brought into the Interior Department by the new Republican Administration. He is serving as director of Interior's technical review staff.

Another outsider is John S. Crout, an engineer with the Battelle Memorial Institute of Columbus, Ohio. The institute is a nonprofit organization conducting research in science, engineering and business practices.

Exempted from the study is the bureau's California projects office, recently set up as the result of an earlier reorganization study of Region 2. This office is now functioning under the direction of C. H. Spencer, former construction engineer for the Hungry Horse project in Montana.

• **Changes already suggested**—The survey team was instructed to work out a program which will permit reorganization without seriously disrupting the necessary bureau activities. Policy matters such as project investigations, findings of feasibility and initiation of construction are outside the jurisdiction of the survey team.

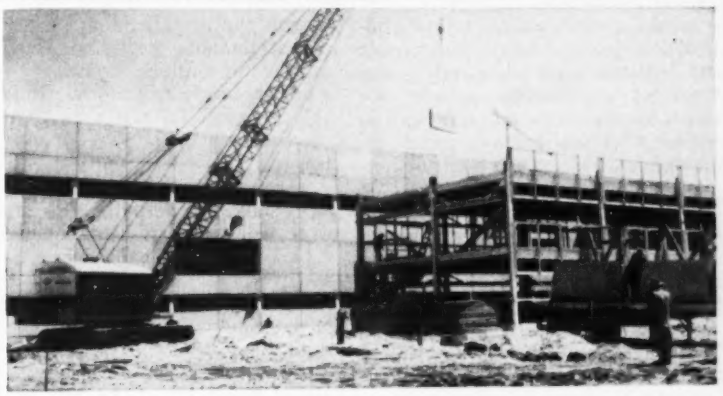
Among other things, the team is to consider recommendations made by a House Appropriations Committee staff earlier this year for bureau changes.

Report of this committee staff found the bureau is "greatly overstaffed with regional and district offices and personnel." It noted that personnel of the bureau have jumped from less than 7,000 in 1945 to more than 14,000 employees in 1946 and continued upward to 19,000 in 1950.

At the beginning of this year, bureau employment was running about 13,800. Since the Republicans assumed control in January, the bureau payroll has been sliced by another 1,400.

Republicans also reduced the Region 2 office at Sacramento, Calif. to a project office.

Appropriations committee staff recommended that the seven regional offices operating at start of the year be reduced to three, and the 18 district offices to be reduced to five.



Sandwich panels enclose big plant

Five buildings of a plant now being constructed for Grumman Aircraft Engineering Co. at Calverton, N. Y., near the eastern tip of Long Island, are being enclosed with concrete sandwich panels and steel-and-aluminum sandwich panels.

Though only 5 in. thick, the concrete panels are claimed to have a U-value (heat-transmission coefficient) of only 0.14, compared with 0.36 for 12-in. masonry. They will be installed up to the level of the bottom chord of roof trusses. The insulated metal panels will be applied above.

The insulation core is a 1½ in. thick glass-fiber board. It is sandwiched between two thin concrete facings. Typical panels are 8 x 10 ft, weigh about two tons. The design is similar to that developed by Ford, Bacon & Davis and Marietta Concrete Corp. (ENR Jan. 24, 1952, p. 34).

Precast Building Sections, Inc., is fabricating the panels at its New Hyde Park, N. Y., plant and trucking them 50 miles to the site, where they are bolted onto the steel frames of the buildings. A total of 170,000 sq ft of wall panels will be installed. The office of Alfred Easton Poor, architect, and Seelye, Stevenson, Value & Knecht, architect-engineer, designed the plant.

WALL PANELS are supported by a crane until bolted to building frame.

Construction continues steady climb; spending seen 6% over last year's

Expenditures for new construction this year are expected to reach $34.6 billion, exceeding last year's record by 6% or $2 billion, according to revised outlook estimates prepared jointly by the Department of Commerce and the Bureau of Labor Statistics. This year's dollar volume of new construction also will represent a new peak in work actually put in place, when adjustment is made to account for various price changes.

The continuation of the steady postwar climb in construction activity into 1953 will result primarily from a sharp rise in commercial building, and substantial increases in expenditures for privately owned public utility construction, private housing, and schools and highway work. The only major types of construction activity for which expenditures are expected to decline are found to be in private industrial construction and farm and hospital building.

The rate of increase over 1952 will probably decline moderately in the second half of the year, reflecting a smaller rise for the last six months than is usual, as outlays for private plant decline steadily, and expenditures for private housing and military facilities taper off.

• Both public and private up—The present outlook for 1953 construction activity is based largely on relatively firm estimates of work already put in place during the first seven months, and on documented information about work under contract and to continue or be completed during the remainder of the year. The former accounts for 56% and the latter for something over 25% of the expected figure for the annual total.

In estimating for the balance, the assumptions were that only mild readjustments in the general economy would take place this year; that close to 1,100,000 dwelling units (private and public) will be started, compared with 1,127,000 in 1952; and that the Korean truce will have no effect on construction this year, and no other major changes in the international situation will occur to affect the level of construction activity.

Private and public construction both will share in the 1953 rise. The dollar volume of private work is expected to reach the unprecedented sum of $23.1 billion, or two-thirds of the total. The sharpest upturn in private activity this year will occur in commercial building, for which outlays will increase about 45% to a peak of $1.7 billion. Facilities actually put in place, however, (expenditures adjusted for price changes) were exceeded during the prosperous 1920s.

Public utility construction, at $4.4 billion, is expected to be at an all-time high both in dollar volume and in physical plant installed, marking the tenth successive year of expansion. Most of the 11% rise in expenditures over 1952 will occur in the gas and electric light and power group, with only moderate increases anticipated in railroad, telephone and telegraph work.

• Home building looms large—Although the downtrend in private industrial building begun in March is expected to continue through the year, a total of nearly $2.2 billion will probably be spent for this work. This is exceeded only by the $2.3 billion spent last year.

A third of all new construction activity and half the outlays for private work will be for residential building ($11.7 billion). The 5% increase over 1952 in expenditures for new nonfarm dwelling units will occur in spite of a decline in units started. This results from higher prices and the unseasonably large number of dwellings begun during the latter part of last year, which were still under construction early in 1953.

The expected total volume of new public construction this year, $11.5 billion, will, like private residential building, account for about a third of all 1953 activity. Only about $3 out of every $10 of public work will be for direct defense purposes—public industrial plant and military and Naval facilities. Public industrial construction, largely work on atomic energy establishments, will advance 15% to a peak of nearly $1.5 billion, as construction of the Portsmouth, Ohio, facility gets into full swing. On the other hand, military and Naval construction is expected to be about the same as in 1952. Some projects were delayed and some may be set aside as a result of the Budget Director's instruction to review federal projects for essentiality.

On the other hand, expenditures for two important civilian types of public construction—highways and schools—will probably rise by 10% and 8%, respectively, this year, to new record levels both in dollar volume and in physical capacity that will be provided. Most of the funds involved in these cases are from state and local sources.

ENR photo by Compton

JAMES MARSHALL—Executive Director

AGC staff shifts

Several officers upgraded in national headquarters

The Associated General Contractors has increased the responsibilities and upgraded the titles of a number of staff executives in its Washington headquarters. Prime reason for the shift was a desire to conserve the health of Managing Director H. E. Foreman and give him more time for overall policy and industry matters.

Operating management—formerly carried by Foreman—is now delegated to James D. Marshall, who assumes the new title of executive director. Backstopping Marshall is Charles S. Embrey, who moves up from administrative assistant to the new post of assistant executive director.

Marshall's former duties in labor relations become the sole responsibility of William E. Dunn, appointed manager of the labor relations department.

Dunn, who has helped many a contractor solve a tough labor problem, has been Marshall's assistant for six years. Before joining AGC, he served as regional attorney in Chicago for the National War Labor Board.

Marshall, however, will continue to have a hand in labor policy matters and will represent AGC on various construction labor committees. He and Edward T. Kelly, labor service advisor at AGC, sit on the National Joint Board for Settling Jurisdictional Disputes in the Construction Industry.

Other staff promotions raise James M. Sprouse to manager of the heavy construction division and Charlson I. Mehl to administrative assistant. The revamped staff is designed to handle more effectively the association's constantly expanding volume of work. AGC now has 6,350 members and 122 chapters covering the entire United States and Alaska.

Federal construction spending to be slowed, cut more in '55

Budget Bureau wants stretch-out of present programs; drastic public works and mortgage policy changes brew

Federal construction is due for further trimming. Already pinched down to 90% or less of originally planned expenditures for this fiscal year—with much sharper cuts in some major categories—federal work again has been placed on the chopping block for equal cutting in fiscal 1955.

Budget Director Dodge has told construction chiefs to start the reduction now by tapering off on scheduled spending this year to forestall a sudden drop next July.

Dodge laid down the economy dictum in a confidential policy letter to all federal departments and agencies. First estimates for fiscal 1955 are due in his office Sept. 15. Dodge told the department heads that they must cut their requests for next year by at least as much below 1954 spending figures as Eisenhower's budgeteers chopped off Truman's estimates this year.

• **Stretch-out Policy**—That wasn't all. Dodge instructed the departments and bureaus to soften the blow that will fall next July by holding back and stretching out their spending this year so that the decline will come gradually and not suddenly.

Dodge specified other means to decrease government spending and increase cash income. Most important to construction people are two proposals: (1) that the government sell mortgages and loans that it now holds, and (2) that it use guaranties and insurance wherever possible in place of loans and grants such as are now made to states, local communities, business concerns, farmers, veterans and foreign governments.

These proposals would mean big changes in the present pattern of construction financing. Carried to logical extremes, they would call for a system of federal insurance or guaranty on state and local borrowing to replace present grants or subsidies for such things as highways, hospitals, slum clearance and public housing.

Changes as radical as that would require legislation. Dodge told the agencies to recommend any new laws that would be needed to carry out money-saving ideas. But neither Congress nor the Administration will want to amend present federal-aid statutes until after the commission on federal-state relations has presented its report some time next spring.

• **Mortgage Dilemma**—More immediate in effect would be any move to unload a sizable chunk of the $3 billion in VA and FHA mortgages held by Fanny Mae. Housing Administrator Cole faces a tough problem on that point. The government could take in some useful cash by offering its mortgages below par and selling them at a loss to private investors. But any such sale would absorb mortgage money that is badly needed for financing new home mortgages. Cole would resist any plan for dumping Fannie May paper that would dry up the home mortgage market.

Dodge also advised the agencies to get out of any business or service that could be sold to private interests or to state and local governments. Biggest properties that could thus be sold are the federal power plants and transmission systems. Any blanket proposal to shift these utilities into private hands would forecast a big change in federal construction, but no such suggestion is likely to be made.

When it comes to trimming construction expenditures during the current year, how much can the agencies cut their spending without wasting the public's money? Dodge told the agency chiefs to carry on their going projects at the "minimum economic rates."

Almost without exception, the "minimum economic rate" for a going project is the scheduled construction rate. As Ralph Tudor, Interior Undersecretary, explains it, the Bureau of Reclamation, for example, could make a temporary reduction in spending by ordering contractors to cut their working forces and slow down their jobs, but the eventual cost to the government would be greater than under present schedules. Contractors have bid and planned their jobs on the basis of lowest-cost construction; to slow them down would merely increase the final cost to the government. And the temporary dollar savings would be small.

Congress and the Budget Bureau have already stretched out one or two big, new projects. At The Dalles on the Columbia River, for example, they figured that power generation could be delayed a year without extra cost to the government. But there are few, if any, other going jobs that can be similarly delayed without incurring some degree of loss.

• **New starts in doubt**—A few new starts perhaps can be held back. The Interior Department, if the screws were tightened, might even have to consider canceling the two-week-old $7.6-million reclamation contract for Monticello Dam on the Solano project in California. Congress just recently released previously appropriated funds to start this project, and an administrative cutoff would invite some congressional wrath.

Aside from Solano, Reclamation has no new projects to start. And the Army Engineers are in almost the same situation on flood control and navigation projects. They are waiting for a decision from the Secretary of the Army and even higher echelons on whether they should go ahead with advertising of the few new increments or improvements for existing or continuing projects that congress voted.

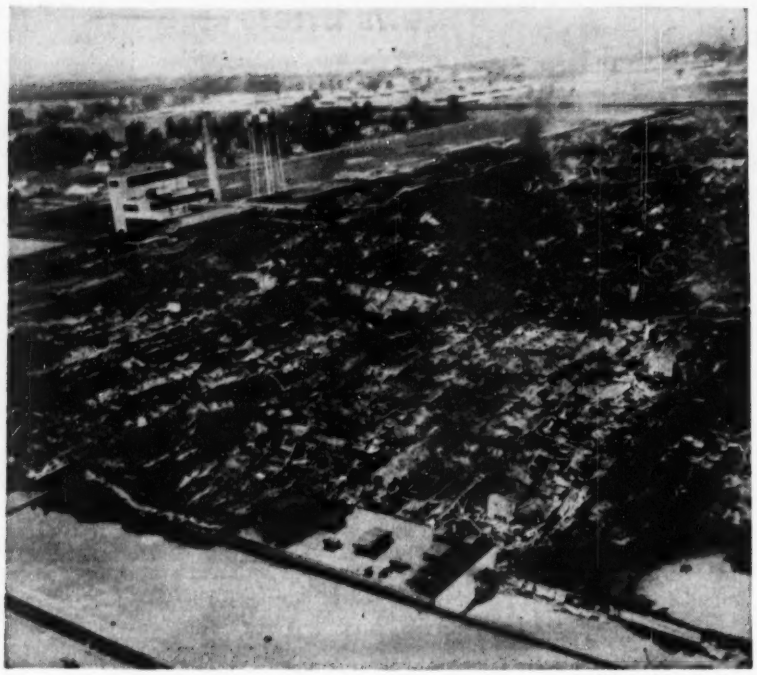
In all, Congress voted less than $4 million for eight such projects—all of them navigation improvements. The jobs—and the amount appropriated for each in fiscal 1954—are: The New York and New Jersey channels of New York harbor, $800,000; Norfolk harbor, Va., disposal area, $700,000; Canaveral harbor, Fla., jetties, $610,000; South Galveston Bay, Tex., alternate route, $487,000; Gowanus Creek channel, Brooklyn, $349,000; Humboldt harbor, Calif., $250,000; Amazon Creek, Ore., $245,000; and Northeast Harbor, Me., 150,000.

It is from such small items as these that the construction agencies in affect are asked to cut their spending during the next ten months, in preparation for a steeper cut next year. The construction chiefs are caught in a tight squeeze; decisions will be tough to make.

• **Recession insurance**—Dodge's policy letter does not forecast federal withdrawal from public works construction. On the contrary, he asks the construction agencies to put increased emphasis on planning. Object: To have a backlog of high-priority projects ready to go when the government can afford them—or when a construction slump calls for some federal help.

Planning money this year was maintained at a level that permits agencies like Reclamation and the Army Engineers to carry on a reasonably effective program. Agency chiefs are not so much worried about their planning. But what disturbs the Corps of Engineers, for example, is uncertainty about continuation of civil works construction.

Here they would like to see a stable program ahead; the shutoff on new starts makes them wonder whether it will be possible to continue progress on natural resources construction.



Wide World photo

RUINS LEFT BY BLAZE which sped through four-year-old General Motors plant at Livonia, Mich., with alarming speed.

Devastation of GM plant attributed partly to inadequate fire protection

Inadequate fire protection was held to be a major cause of the oil-fed blaze that devastated the four-year-old General Motors plant at Livonia, Mich., last week. The speed with which the fire traveled through the structure, igniting a pitch roof, resulted in complete destruction of the 1,500,000-sq ft steel frame building.

Arnold Renner, chief of the fire marshal's division of the state police, charged that the building was inadequately protected. Calvin Roberts, Livonia fire chief, agreed that automatic sprinkler coverage was inadequate. Sprinkler coverage was limited to only 15% of the plant and was concentrated generally in the north and south ends of the building. The huge center areas were only partially covered.

General Motors would comment only that the plant was built in conformity with building codes, fire regulations and insurance regulations. Roberts confirmed the GM statement and noted that the plant was as well protected as "90% of industrial plants."

The fire exploded through the plant with frightening speed. Apparently it was set off by a spark from a welding iron which ignited a pan of Oleum, a fluid used to clean and preserve automotive parts prior to shipment. At that point the fire looked as though it could be easily controlled. Somehow, though, the fire leaped to the oil along a conveyor chain, and up to the conveyor lift itself. It raced the length of the line and up to the roof where pitch was ignited. How the fire spread so quickly is not as yet known, but there were unconfirmed reports that workmen sprayed the Oleum- and oil-fed blaze with a water hose and, of course, spread the burning oil.

Besides the oil and pitch, oil-soaked metal chips off machines blazed up as well. The heat was so intense that steel beams and window casings turned red hot and buckled. Building supports collapsed and sent large roof sections crashing to the floor. Flooring was of wood block, some of which had soaked up oil from machines and manufactured parts. Sections of the floor flared and burned rapidly. Large brick-walled areas caved in along with the roof.

The plant itself covered a two-block-long site on Plymouth Road in Livonia, west of Detroit. It was built four years ago.

The main manufacturing section of the building was of one-story steel and brick construction, with two stories on the front to accommodate offices. Receiving and shipping docks and a railroad siding with overhead cranes were on the west side of the plant.

Cost of the building has been estimated unofficially at $22.5 million.

Baruch housing project dedicated by President

In tribute to a warm and longstanding friendship, and to the social reform being brought about by federal housing developments, President Eisenhower made a special flight Aug. 19 from Denver to attend the dedication of the Baruch Houses and the unveiling of a memorial bust and playground in New York City.

Named after Bernard M. Baruch and his father, Dr. Simon Baruch, this federal-aid project of the New York City Housing Authority will, when completed, house 2,194 families. Fourteen city blocks will be consolidated into two superblocks separated by a curving drive for this 27-acre, $32-million project. Only 12% of the land is covered by the buildings; the remainder of the area is, in effect, a park with walks, benches, planting and playgrounds.

Six reinforced concrete buildings are now under construction, and eleven more will be built to complete the project. In plan, each structure is a series of interconnected diamond shapes, the exterior appearing to be corrugated vertically. The designers are Emery Roth & Sons, Richard Roth, architects. Corbetta Construction Co. is the general contractor for the first section.

Concrete canal floor develops huge cracks

An investigation of mud in the feeder canal of the Columbia Basin irrigation reservoir reveals that the concrete floor has cracked in a number of places.

A. F. Darland, Reclamation Bureau supervising engineer at Grand Coulee Dam, said last week that the bureau is studying the damage so it can be repaired before the pumping season next spring.

In the first section of the canal—which connects the irrigation reservoir to the Grand Coulee pumping station—cracks and holes were found in the 7½-in. concrete floor. Divers and glass-bottomed boxes were used to check the canal lining.

"The damage is considerable," Darland declared. "We are studying it to see what caused it, so we can prevent a recurrence."

There is enough water in the irrigation reservoir to see the basin through the present season. Pumping has stopped during the study of the cracked canal.

Spanish bases

Reports indicate Franco has ok'd four airfields and two naval stations

The U.S. and Spain are now on the verge of signing the long-awaited agreement on establishing air and naval bases in Spain. Thus far there has been nothing official out of Washington but reports indicate that the Spain has okayed terms under which we will construct four air bases and get naval rights at two locations.

Estimates right now indicate that the naval bases would be located at Cadiz on the Atlantic Coast near Gibraltar and at Valencia on the Mediterranean, about half-way up the Iberian Peninsula. Construction at the two naval bases would be relatively minor in nature—largely storage facilities. Primary purpose for the naval bases is anchoring rights.

Four or five air bases will be constructed. Madrid and Seville are on the "must" list. It's likely that the base program at Madrid will center largely around expansion of the present air base. Seville would be the general supply depot for all activities. Two other sites are also considered the most likely ones for fighter bases: Barcelona and Zaragoza.

The Air Force now has about $100 million set aside for base construction to get the programs started once the agreements are signed. The Spanish government reportedly has been holding out for considerably more than this amount in loans, direct payments, and economic aid. Washington estimates that the entire Spanish program, including mutual aid funds, economic aid, and base construction, may go as high as $325 million.

Prefabricated housing to be studied

A long-range research program in the field of home prefabrication has been established with the formation of an Engineering, Design and Research Committee by Prefabricated Home Manufacturers' Institute of Washington, D. C. The committee is headed by Richard B. Pollman.

"The major functions of the research work will include improvements in home design and planning and a study of technical advance in manufacturing, distribution and construction," according to Mr. Pollman.

"The committee also will work to establish engineering standards and test procedures that will be recognized universally and accepted by buyers, mortgage lenders, government agencies and building inspectors," he said.

News briefs

• **Money troubles** — Rising costs threaten a stretch-out of Maine's seven-year highway program, according to Lucius D. Barrows, chief engineer of the State Highway Commission. The $98-million program is just entering its second year. Although new cost studies by Barrows' staff are not yet completed, present estimates are that as much as $130 million may be required to complete the program in the next six years.

• **Monticello Dam contract**—Contract for construction of Monticello Dam, key structure in the $47-million Solano project in California, has been awarded to Peter Kiewit & Sons of San Francisco and Parish Brothers of Benicia, Calif., on a joint bid of $7.6 million. First phase of construction will be the relocation of the highway over the south abutment of the dam. The concrete arch type dam will be located about 70 miles from San Francisco and 50 miles west of Sacramento. The project is designed to provide water for irrigation and domestic use in Solano County.

• **Alaska pipeline**—Bids will be called in October for a $40-million, 610-mile petroleum pipeline in Alaska, according to the North Pacific Division, Army Engineers. The pipeline, which will run from Haines to inland defense bases near Fairbanks, is being built under an agreement worked out with the Canadian government. Designed to provide northland defense bases, a protected line of supply for oil and gasoline, the project will take about a year to complete. Some of the line will parallel existing highways along the Wrangell mountain range, then cut into Yukon territory to Canada to reach Fairbanks. Tentative plans call for eight-inch pipe.

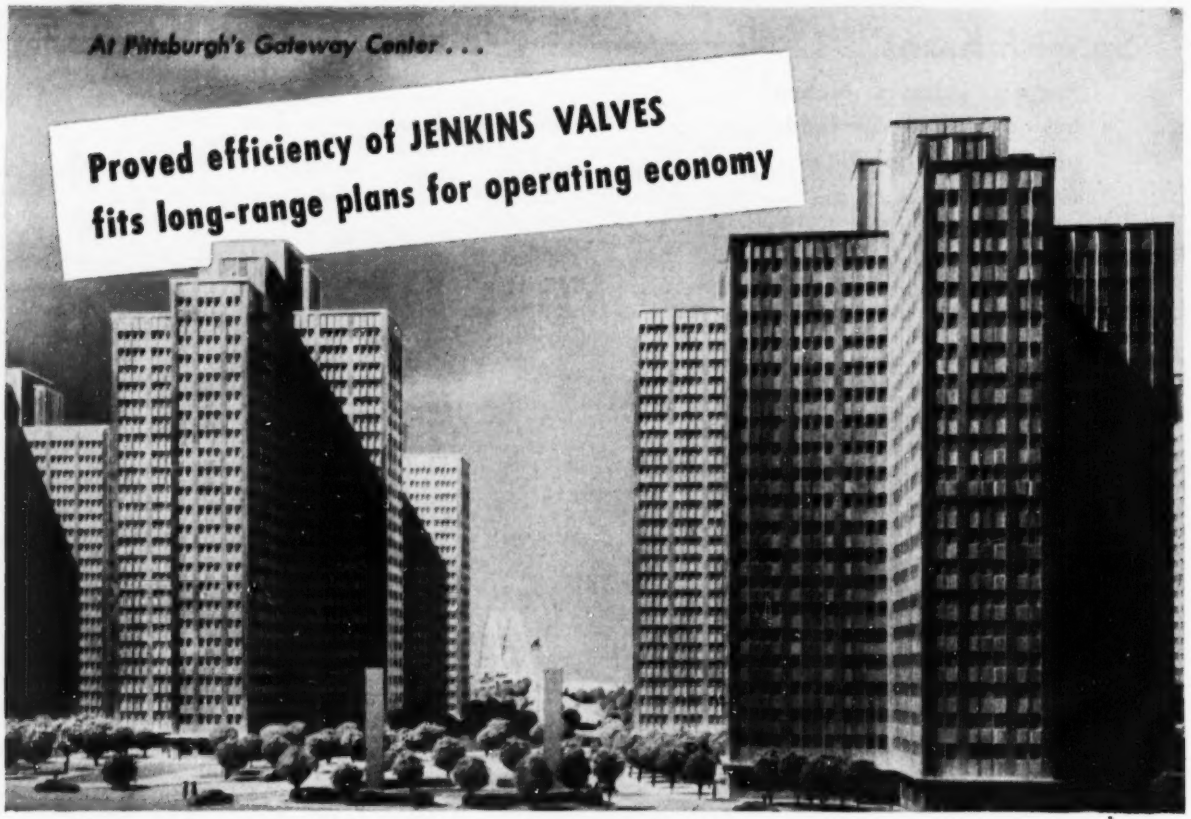
• **How to preserve parking space**—Plans have been requested for a 15 to 20-story building in downtown Baltimore that will enable a major part of the structure to bridge a 23-year-old, four-story garage. Harrison & Abramovitz, New York architects, have been engaged to design the building. It will be necessary to cut through the garage to make way for the new footings, but most of the original garage space would be preserved. The building will extend through a city block and, according to present reports, may be 14 to 16 stories high on one street and as much as 20 on the other. Being built for Commercial Credit Corporation, the structure is expected to have an aluminum exterior. Another New York firm, Edwards & Hjorth, consulting engineers, will assist in the design work.

• **Another Hilton enterprise**—Contracts have been let for a $14-million 450-room, eight-story luxury hotel at Beverly Hills, Calif., by the Hilton Hotel Corp. An underground garage extending to the full dimensions of the 8½-acre site will accommodate 600 cars. The building, which will have three slender wings radiating symmetrically from a center core, will be of reinforced concrete and structural steel. Welton Becket & Associates are the architects and engineers; Del E. Webb Construction Co., the general contractor.

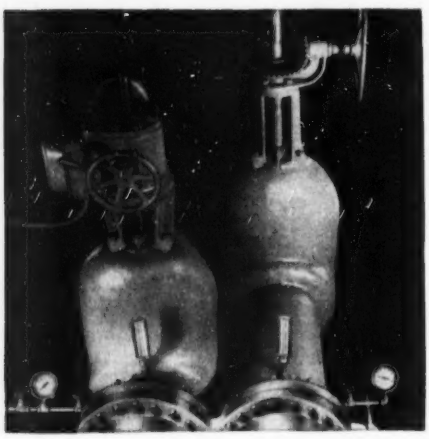
• **Beetles spur road building**—Efforts of the U.S. Forest Service to halt infestation of forests in western Montana and northern Idaho by the spruce bark beetle have led to a $5-million road construction program. One of the best ways to halt the menace is to harvest timber that already has been infected, and this often requires new roads into remote areas. The Bureau of Public Roads as of Aug. 1 had awarded 14 contracts for work costing $3.5 million, with another seven projects costing $1.2 million out for bids. The first contract in the program was awarded in May.

• **More toll road funds**—The West Virginia Turnpike Commission has disclosed that it will need more money than is available from its original $96-million revenue bond issue for completion of the two-lane toll highway now under construction between Charleston and Princeton. Specific amount of additional funds required can't be determined before sometime in October.

• **Michigan Authority**—Gov. G. Mennen Williams of Michigan has described his recent appointments to the State Turnpike Authority as representing "a cross-section of Michigan business and engineering leadership." The agency will study the proposed Detroit-Chicago and Bay City-Detroit-Toledo toll highway. The non-salaried authority will consist of John R. Whiting, board chairman of Consumers Power Co.; Francis J. Van Antwerp, field superintendent of the Raymond Durocher Contracting Co.; Rollin M. McConnell, Detroit investment banker, and William E. Slaughter, Jr., president of Aurora Gasoline Co. State Highway Commissioner Charles M. Ziegler will serve as the fifth member, as has been provided by the enabling act.



Architects: IRWIN CLAVAN, N. Y. and EGGERS & HIGGINS, N. Y. *Owner:* THE EQUITABLE LIFE ASSURANCE SOCIETY OF THE UNITED STATES *General Contractors:* STARRETT BROTHERS & EKEN, INC., N. Y. *Heating, Ventilating, and Air Conditioning Contractor:* KERBY SAUNDERS, INC., N. Y. *Plumbing Contractor:* C. H. CRONIN, INC., N. Y. *Mechanical Engineers:* MEYER, STRONG & JONES, N. Y.



At Gateway Center, this section of the air conditioning system contrasts the wide size range of the many thousands of Jenkins Valves installed. Above right, is a large Iron Gate with a 90° offset handwheel. To the left is another large Iron Gate, motor-operated. Below at left and right are small Bronze Gates controlling water lines to pressure gauges.

Widely acclaimed as an architectural triumph in urban redevelopment, Pittsburgh's giant multi-million dollar Gateway Center is a notable example of long-range planning.

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Trouble expected as carpenters leave AFL

Wednesday of last week was a father-and-son day in Chicago. William Hutcheson and his son, Maurice, caught nearly everyone by surprise when they pulled their United Brotherhood of Carpenters and Joiners out of the American Federation of Labor.

The secession threw the whole labor picture out of focus, immediately, among other things, minimizing possibilities of accord between AFL and the Congress of Industrial Organization.

Close observers saw a number of implications—all of them spelling trouble for construction, as well as for other industry. Leading possibilities are:

• A massive reshuffling of unions that would bring together the carpenters, John L. Lewis' United Mine Workers, Dave Beck's teamsters, and the machinists group.

• A power play to put the carpenters—numerically the biggest of the building trades—back on top of the AFL heap, after the loss of the prestige position of AFL president to George Meany, a former plumber; loss of the secretaryship of labor to Martin Durkin, a former plumbers' official.

Insiders discount the first possibility—although Lewis is an avowed enemy of Meany (as result of a 1947 tongue-lashing administered by Meany). But UMW's United Construction Workers and its catch-all District 50 just do not seem to be compatible with craft-proud carpenters. And Beck's acceptance of the AFL vice-presidency cleared by the Hutchesons' withdrawal, seemed to put a final period to the rumor.

The second point seemed most valid. Undeniably, the carpenters have been unhappy with their position as generally the lowest-paid of the skilled trades; undeniably they (and other building trades groups) haven't been happy to have so many top posts go to men from other crafts. In fact, the move in Chicago shouldn't have been as much a surprise as it was—it was heralded in New York some weeks ago (ENR July 9, p. 17) when the local carpenters upset the carefully balanced apple-cart of the 25 other trades by forcing a break in the five-year long pattern of master agreements between construction employers and the local building trades council (headed by Howard McSpedon, who is an electrician).

• **Trouble in the making**—Whether AFL president George Meany called a Hutcheson family bluff—something his predecessor William Green often did not do—is pure speculation. At any rate, the carpenters already have started flexing their muscles. In New York, for example, the big District Council of Carpenters and Joiners has threatened to ignore an arbitration system which for 20 years virtually has eliminated jurisdictional strikes.

• **Chummy with building trades**—The carpenters' fight is not with the building trades unions. Although there have been many jurisdictional disputes involving the carpenters and other building crafts, most tension is with other AFL unions not in the building trades.

Best known is the fight between the millwrights—part of the carpenters—and the machinists over installation of machinery. The machinists quit the AFL for a period over claims that the AFL failed to enforce jurisdictional decisions in its favor against the carpenters. The machinists are back in the AFL, but have been harassing the carpenters by taking fights to the National Labor Relations Board.

For years, the carpenters have held withdrawal threats as a club over the AFL executive council to keep it from interfering. Hutcheson has submitted resignations before, but they always have been rejected. This time the council accepted.

The carpenters and other building trades unions have complained, too, of AFL failure to enforce jurisdictional rights with respect to unions not in the building trades doing construction work. One is the Brotherhood of Maintenance of Way Employees, with 182,000 members, headquartered in Detroit. Complaint is that railroads use members of this union for construction on railroad rights-of-way.

• **Contractors riled too**—Other companies doing their own construction are using workers in unions already in their plant rather than relying on the building trades, it is charged. For example, a sugar company used its own men to build a $3-million refinery in California. This has become a matter of concern among the general contracting industry. Also non-construction companies using their own men often do their own subcontracting, thus avoiding general contractors.

The AFL building trades have raised this issue with respect to steel construction. The AFL and the Associated General Contractors opposed, for instance, a demand of the CIO steelworkers in the steel dispute that went to the Wage Stabilization Board last year, which was to prevent subcontracting of construction work.

The carpenters didn't like the no-raiding agreement approved by the executive council because it would interfere with a drive of the carpenters to cut out the CIO as bargaining agent at the big Weyerhauser lumber operation in the Pacific Northwest.

Two strikes end

Resumption of over half a billion dollars worth of construction was fairly assured this week as striking sand and concrete truck drivers in the New York City area voted on acceptance of a package of gains.

Biggest surface gain for the drivers is a 40-cent-an-hour wage boost, a dime more than was first offered, which increases their pay to $2.40 an hour. The drivers originally had asked for a 75-cent hike.

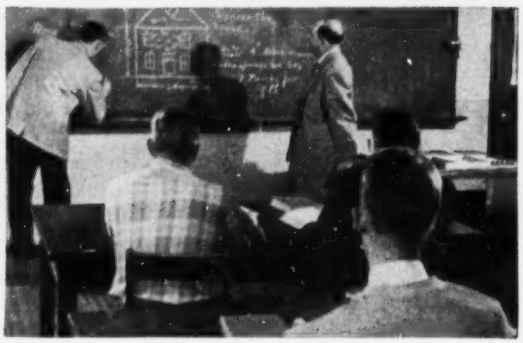
• **Under the surface**—Length of the strike—seven weeks—has been attributed to an internal struggle for control of the AFL teamsters local.

A deeper issue—barn seniority vs. company seniority—also held up agreement. An insurgent group, made up of older workers, has objected to the barn seniority system, whereby day-to-day seniority, which becomes an issue when a truck or two has to be dropped during the day, is measured by the time a driver reaches the yard at the beginning of his shift. The anti-barn-seniority groups held out for a system based on longevity with an employer.

• **Wheels turn in St. Louis**—A strike of AFL truck drivers against ready-mix concrete firms, which blocked construction for 12 weeks in the St. Louis area, was settled last week.

Top-level officers of the teamsters' union showed up in St. Louis and rammed through the surprise settlement with none of the local officers present.

Settlement terms include: A 22-cent-an-hour pay boost, two-week vacations for five-year drivers, sick-leave payments and an employer-financed hospitalization and life insurance plan.



IT TAKES MORE than a knowledge of bricklaying to be a brick mason, as these scenes from film show.

Labor Dept. makes movie

A documentary film—"Apprentice Training"—showing the step-by-step development of a typical apprentice into a full-fledged journeyman is available free of charge. This film may be obtained at regional offices of the Bureau of Apprenticeship, U.S. Department of Labor.

The film centers its story on a young high school graduate, starting with his apprenticeship as a brick mason and following his progress through to full journeyman status.

Especially stressed the functions of the joint labor-management committee, the requirements of classroom instruction, the opportunity to earn while learning.

Produced two years ago for the U.S. Department of State to show foreign nations how the apprentice system works in this country, the film now is available with an English soundtrack.

Journeymen:

Many need retraining conference speaker says

Development of a retraining program for journeymen workers was urged a week ago by the heavy construction trades section of the first North American Conference on Apprenticeship.

The section, which met in San Diego, Calif., saw as problems:

- Those who became journeymen without complete apprentice training and who now must be uprated if they are to be of value to themselves and to the construction industry.
- Elimination of such substandard journeymen through improved training of new apprentices.

The section's views coincided with a statement to the full conference in an address by Lloyd Mashburn, Undersecretary of Labor.

Mashburn estimated that no more than half of the journeymen in the country—"perhaps slightly more in the construction trades"—were trained by apprenticeship.

As a result, he sees the need for training many journeymen almost as acute as the need for more apprentices. He said, "Now that we are faced with the fact that a number of inadequately trained journeymen are in the trades, we just can't wave a magic wand and make them disappear."

The Department of Labor, he reported, has begun a "skill improvement program" for journeymen, designed to meet situations in various trades. He says this program must have the full support of state apprenticeship committees to make it work.

• National group too—The heavy construction panel section also saw a need for active national apprenticeship committees as an aid to local committees. The section decided that many problems facing local committees could be solved by a national organization.

In the section meeting for housing contractors and building trades there was recognition that there must be a constant effort to keep apprenticeship standards up-to-date to match the technological progress of all trades.

Some delegates expressed a belief that there still is too much wasted time in apprenticeship training, although they admitted that much of this had been eliminated in the past 50 years. It noted that a generation ago apprenticeship training usually took seven years, now it has been cut to four in most building trades and to as short as three in some.

The chairman of the section, S.D.C. Chutter, assistant manager of the Canadian Construction Assn., Ottawa, Ont., noted that in Canada a wide program of pre-employment training is utilized so that the apprentice already has obtained some basic knowledge of the trade before actually entering on his apprenticeship.

The first conference on apprenticeship drew an attendance of about 1,000, including, roughly, 40% management people, 50% labor union representatives and about 10% from state, federal and Canadian agencies.

Peace at Joppa?

Bechtel working out job peace agreement

Top-level leadership of American Federation of Labor building trades unions has been asked to work out agreements to provide machinery for settlement of disputes which for two years have slowed building of a plant at Joppa, Ill., to supply power for the Atomic Energy Commission.

Bechtel Corp., called in to finish the plant started by Ebasco Services (ENR Aug. 13, p. 21), met with members of the AFL's building and construction trades department in Chicago last week to outline the problems Bechtel faces at Joppa.

Impatient with building trades locals in the Joppa area, scene of two score strikes in the past two years, the executive council of the department authorized negotiation with Bechtel of the job agreement.

Meanwhile, Bechtel officials have refused to say just when work will be resumed on the $160-million-plus plant, progress on which was half a year behind schedule when Ebasco lost its contract from Electric Energy Inc., a five-firm power combine.

Over 80% of the migratory construction workers laid off during the switchover of contractors have left the site with their families. Officers of Joppa locals, which have shrunk for the time being to almost normal size, have issued a series of statements in which harmony is predicted under Bechtel operation.

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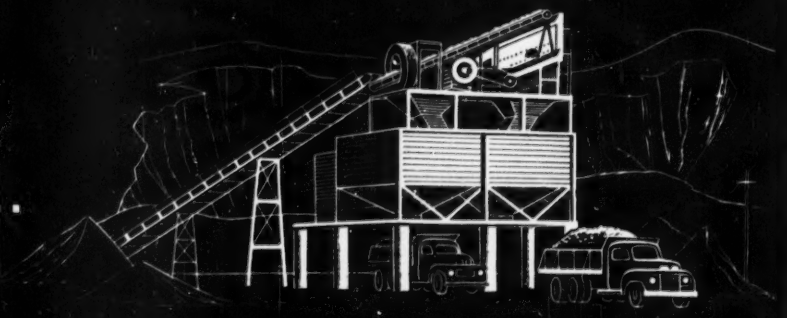
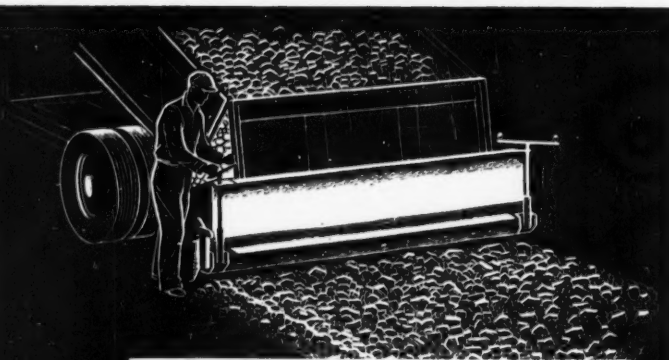


Costs are DOWN on the job...



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Wage increases follow ENR forecast

With most of the new construction wage contracts for 1953 signed, here's how the picture looks in the 20 cities covered by ENGINEERING NEWS-RECORD's survey.

Boosts hold close to the 10-15-cent pattern forecast in the spring.

• Common labor unions won increases in 16 cities, with 13 falling into the 10-15 cents per hour bracket. In three cities common laborers won 7-7½-cent boosts. Average increase is 11½ cents per hour.

• Structural ironworkers came out on top among three skilled trades, averaging 15.8 cents per hour. Thirteen cities reported 10-15-cent increases, while in five cities boosts ran from 15½ cents to a high in Pittsburgh of 35 cents.

• Carpenters averaged 14.4 cents per hour. In 11 cities they won hikes in the 10-15-cent range, and in four cities they were given increases in the 17-20-cent bracket.

• Bricklayers came up with an average increase of 11.3 cents for 17 cities reporting higher rates. Their wages rose from 10-15 cents in nine cities, less in six others.

Among other skilled trades, hoisting engineers won boosts averaging 16.7 cents, and steamfitters' wages rose 15.6 cents.

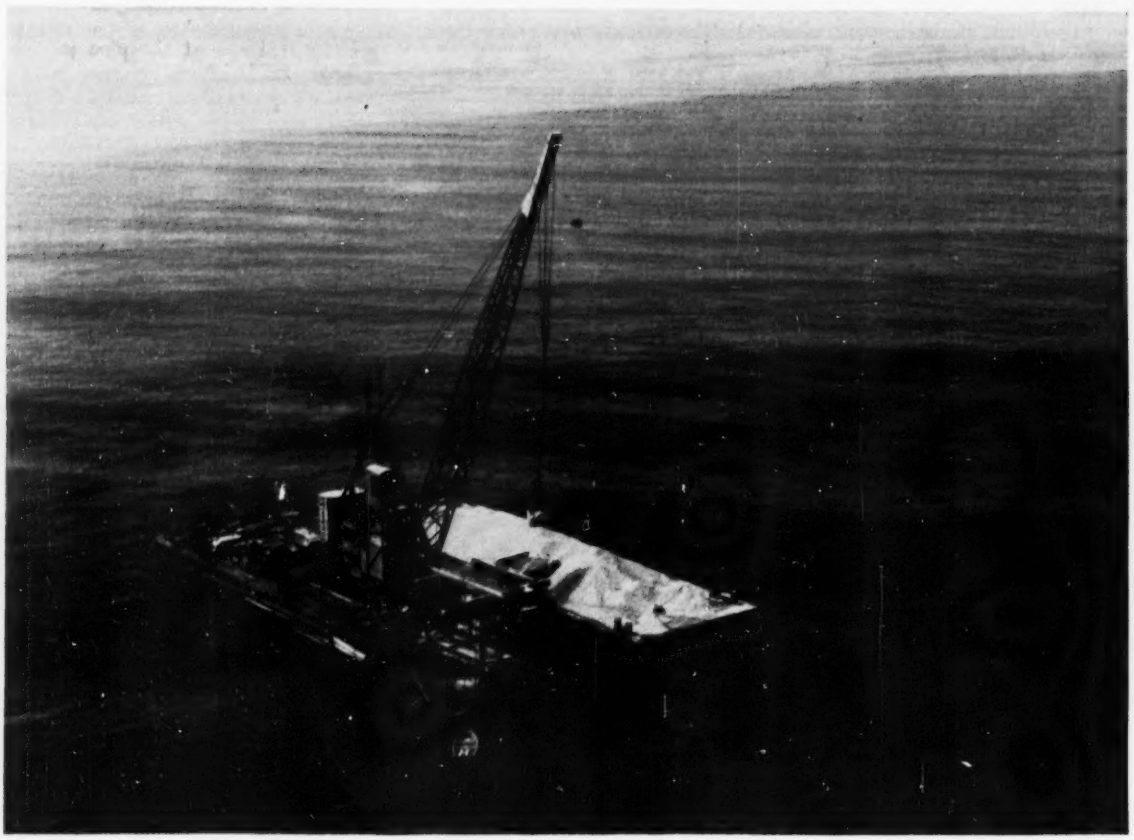
Pattern of 1953 Construction Wage Increases

Based on reports to Engineering News-Record, Fringe Benefits Included

Amounts in brackets show increase asked

City	Common labor	Bricklayers	Carpenters	Structural iron-workers	Other trades	
Atlanta	7¢	20¢	15¢	15¢	Hoist. Engrs.: 25¢	
Baltimore	(11¢)	(25¢)	17¢	15¢	Steamfitters: 10¢ Painters: 10¢	Hoist. engrs.: 25¢ (30–50¢) Plasterers: 12.5¢
Birmingham	7.5¢	....	....	40¢	Electricians: 12.5¢ Steamfitters: 15¢	Plasterers: 10¢
Boston	Negotiating	12.5¢	12.5¢	13¢	Plasterers: 15¢	
Chicago	15¢	15¢	15¢	15¢	Electricians: 15¢ Hoist. engrs.: 20¢	Plasterers: 9.5¢ Steamfitters: 15¢
Cincinnati	10¢	10.5¢	(30¢)	10¢	Plasterers: 12.5; + 5¢ 12/1 Electricians: 10; + 10¢ 9/1	Steamfitters: (15¢)
Cleveland	12.5¢	13¢ (For welfare fund; asking addit. incr.)	12.5¢	12.5¢*	Hoist. engrs.: 12.5¢ Truck drivers: 25¢ Steamfitters: 12.5¢	Plasterers: 17.5¢ Electricians: 12.5¢ Other trades: 5¢
Dallas	7.5¢	6.4¢	13.8¢	12.5¢	Hoist. Engrs.: 12.5¢ Electricians: 15¢	Steamfitters: 13.8¢
Denver	(7.5¢)	5¢	(15¢)	25¢	Steamfitters: 15¢ Electricians: 10¢	Hoist. Engrs.: 7.5¢
Detroit	10¢	12¢	15¢ (Incl. 5¢ ins.)	5¢	Truck drivers: 17.5¢ Electricians: 17¢	Hoist. engrs.: 30¢ Steamfitters: 25¢
Kansas City	10¢	12.5¢	12.5¢	12.5¢	Hoist. engrs.: 12.5¢	
Los Angeles	11¢	11¢	13¢	15.5¢	Hoist. engrs.: 12¢ Truck drivers: 11–12¢ Electricians: 10¢	Tractor, shovel, crane operators: 13–14¢
Minneapolis	13¢	7.5¢	15¢	10¢	Electricians: 20¢ Steamfitters: 17.5¢*	Hoist engrs: 15¢ Plasterers: 15¢
Montreal	No negotiations so far for higher wages. Most contracts being renewed for '53–'54					
New Orleans	15¢	10¢	10¢	10¢	Plasterers: 7.5¢ Steamfitters: 10¢	Hoist. engrs.: 10¢ Electricians: 27.5¢
New York	15¢	2¢ (½% incr. W. F.)	19¢	15.7¢	Hoist. engrs.: 19¢	Plasterers: 5¢
Philadelphia	12.5¢	25¢	20¢	11.5¢ (Incl. 10.5¢ W. F.)	Hoist. Engrs.: 20¢	Steamfitters: 22.5¢
Pittsburgh	12.5¢	7.5¢	20¢	35¢	Hoist. engrs.: 25¢	Plasterers: 22.5¢
St. Louis	10.5¢	7¢	7.5¢*	12.5¢	Hoist. engrs.: 5¢	Steamfitters: 15¢
San Francisco	15¢	15¢	12.25¢	15¢	Truck drivers: (15¢)	Tractor, shovel, crane operators: (25.5¢)
Seattle	Only wage increase expected is 10 cents per hour for health and welfare funds					

* Revised



AT SEA—A sturdy tower provides positive control of sewer outfall sections being placed on the ocean bottom, while floating rig does the heavy hoisting. Gravel going into hopper is bedding for pipe.

Tower places ocean outfall

A construction tower—chosen for more positive control than floating equipment would afford—took over the laying of a deep-water sewer outfall extending 7,000 ft into the Pacific Ocean, after the section through the surf had been placed within sheet piling from a timber trestle.

The 78-in. reinforced concrete pipe —laid and jointed with special care to prevent later shifting and leakage —is the longest ocean outfall on the West Coast. It is to carry settled and chlorinated sewage far enough off shore to prevent beach pollution, and it is a part of an $8-million sewage disposal project being carried out by the County Sanitation Districts of Orange County, Calif.

Pipe is being placed and its joints seated by a four-legged tower standing on the ocean bottom in water as deep as 55 ft. Legs of 12-in. pipe, braced by 4-in. pipe, form a tower with 25-ft square top and 65-ft height extendable to 80 ft.

A dual-drum, gasoline powered hoist on the tower lifts the 32-ton pipe lengths and suspends them just above the ocean bottom, where they are seated with hand winches at the direction of a diver. The hoist operates through a walking beam or trolley arrangement that permits maneuvering of the pipe lengths while they are being placed in the trench.

Pipe is delivered to the job by barge in 24-ft lengths, ten at a time. A barge-mounted 50-ton crane places the units on the ocean bottom near final position (lengths are sometimes stored on the bottom while the barge is returned to Long Beach Harbor for more). Then the crane lifts the tower over the pipe to be seated. The tower in turn lifts the pipe section off the bottom by a double cable sling arrangement.

Cables from the hand winches on the two in-shore legs of the tower are hooked over the out-shore end of the pipe to be seated. Two additional hand winches are mounted on the out-shore legs of the tower and cables from them are hooked to the in-shore sling supporting the pipe section. Thus positive control of the seating operation is assured.

Finally, as the pipe is suspended at proper elevation over a prepared gravel bed, additional gravel is jetted underneath it. Gravel is delivered by barge and transferred to a hopper on the tower by a clam shell on the barge-mounted crane. The hopper delivers the gravel through underwater tubes.

In all these operations, divers are of prime importance. Two contractors' divers hook the pipe slings, guide the seating process from underwater and manipulate jets for the gravel base. And an engineer's diver inspects the underwater work.

Proper level of the pipe is assured by two tide gages. One accurate unit is set on the bottom of the ocean. Another is mounted on the outshore end of the pipe being handled. The contractor's engineer checks between these gages by field glasses to guarantee proper position.

• **Joint detail**—Joints are machined cast-iron with a rubber gasket. The cast-iron is alloyed with the following minimum percentages of other metals: chromium, 0.40%; copper, 0.60%; and molybdenum, 0.35%. Alloying is necessary to provide resistance to reaction with the salt water. Lead calking is used only where excessive leakage is encountered and

IN THE SURF a timber trestle was the work platform. And trench into which the pipe is placed has sheetpile protection.

to date the use of lead calking has been rare.

Specifications require that the joint rings be welded to the pipe reinforcing. The pipe-making subcontractor — United Concrete Pipe Co.—has found it more economical to bolt to the joint rings steel angles that are in turn welded to the reinforcing. This eliminates use of expensive nickel alloy rods needed for the cast-iron welding. And it permits simpler procedures. The double weld otherwise required would generate heat and tend to distort the rings. The welder would have to make one weld and move on around the ring, returning for the second weld after the heat dissipated. This costly double procedure is eliminated by the bolted angles. All of this welding work is later encased in concrete so there is little danger of steel corrosion taking place.

• **External bolting**—The joint detail also includes an external bolting device to guarantee permanence of the joint seating. A 1¼-in. diameter bolt acting on cast-iron clips holds against cast-iron seats cast into the concrete. These bolts are placed by divers after the pipe seating has been completed. They tighten up, then after an additional 500 ft of pipe has been placed, the nuts are loosened one and a half turns. This permits some adjustment in case of movement of the ocean floor but will prevent the pipe sections from parting by this same movement.

The joints are required to be seated with a 1-in. space between ends of adjacent pipe sections. To facilitate this and to prevent damaging the pipe ends, the contractor is placing a length of manila rope around the male joint. Then as this is pulled home into the female joint the pipe sections are almost automatically stopped at the proper place.

• **Leakage limit**—Because the purpose of the pipe line is to carry sewage away from the beach, a very tight leakage specification must be met —100 gal per inch of diameter per 24 hours per mile of pipe. In other words, for the 78-in. dia pipe leakage can only be 7,800 gal per 24 hours per mile. (Normal flow is expected to be in excess of 100 mgd).

The contractor is testing each joint as (or shortly after) it is made. This is accomplished by a traveler mounting an inflatable ring. This unit moves inside the pipe, and the ring is inflated against the pipe joint for testing. The several joints tested thus far have withstood that 10-psi specified pressure. In fact on some the pressure was run up to 19 psi with no leakage detected—as would have been indicated by a dropping of pressure.

• **All in trench**—The deep-water section of the outfall is placed in a trench. Material is removed by dredging with jet agitated suction. The inshore 1,750 ft of the line is also placed in a trench but it is inside a sheet pile section to minimize disturbance caused by action of the surf. This work is accomplished from a 22-ft wide timber trestle. The excavation and pipe-placing work is done by a gantry crane operating from the trestle.

The trestle is 22 ft wide and has timber pile bents some 11 ft on centers. The timber piling is untreated but it was ordered with the bark on to inhibit action by toredoes.

• **Rock backfill** — Extensive use of gravel and quarry rock for pipe bedding and cover distinguishes this job. Most other outfalls have used sand or natural bedding (some have been completely encased in concrete in the surf section) to protect from surge action. The bedding also is intended to reduce the possibility of the pipe settling and breaking a joint should a joint start leaking.

The rock is carefully selected and graded. And it is just as carefully placed. Gravel for bedding has a 2½-in. maximum limit and not more than 10% can pass a No. 8 sieve.

• **Treatment works next**—The outfall work is part of a program that will take sewage from municipalities and unincorporated areas in Orange County. It has been delayed somewhat by local political differences. Other contracts are currently under way on construction of main sewers. An $847,897-contract for the sewage plant has been awarded to a joint venture of Fred J. Early Co., Inc. and Peter Kiewit Sons Co. The contract calls for completion in 300 days.

The work is under the direction of the county sanitation districts of Orange County, Calif., for which Lee M. Nelson is chief engineer and general manager, having succeeded Raymond Ribal in that position early this year. Design work is being done by a joint venture of Harrison & Woolley of Santa Ana and Headman, Ferguson & Carrolo of Phoenix. The former firm is designing and supervising construction of the main sewer lines and the outfall. The latter firm is

ENR Staff photo

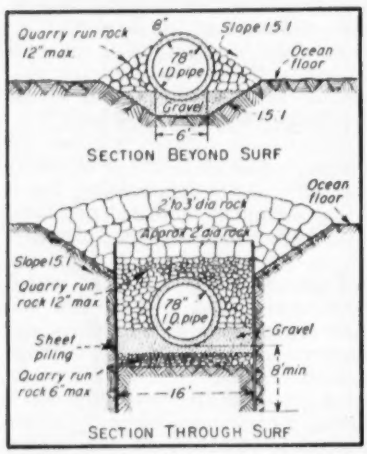
DIVER GOES DOWN to see that the pipe is seated and to place and adjust . . .

ENR Staff photo

JOINT CLAMPS especially designed to prevent the pipe from parting in case of movement in the line.

performing the same duties for the treatment plant.

The outfall is being built under a $2-million contract by Healy Tibbitts Construction Co. of San Francisco with Richard Smith as project manager. Robert R. Helen is manager of all southern California activities for Healy Tibbitts



TYPICAL SECTIONS through 78-in. outfall.

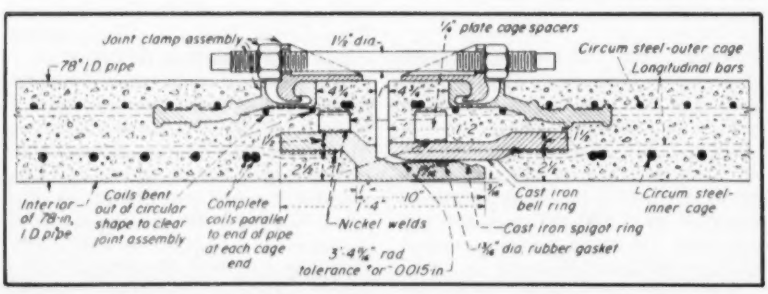
• For comparison's sake—The Orange County outfall is one of several built in the West in recent years. Others include:

Los Angeles County Sanitation District's White Point Outfall (ENR Mar. 4, 1948, p. 88)—Rocky bottom sloping to 100-ft depth in 5,000 ft; favorable off-shore currents; steam winch on shore pulled pipe home; no apparent difficulty in welding alloyed cast iron joint ring to the reinforcing.

Hyperion Outfall built for the city of Los Angeles (ENR Aug. 5, 1948, p 64) — Greater flows of effluent; winches on parallel trestle seated pipe.

East Bay Municipal Utility District Outfall into San Francisco Bay (ENR June 15, 1950, p. 38)—On mud bottom; subject to tidal action but no surf; final seating of pipe accomplished by bolt attachments on outside of pipe, tightened by divers; joint detail included redwood strips on side and for spacing between pipe ends.

Honolulu Outfall, Hawaii (ENR May 17, 1951, p 32)—Only 3,400 ft length required to reach 50-ft depth; tower used, but sheave and cable arrangement differed from the Orange County job; tower handled two 16-ft lengths of pipe at a time, by strongback rather than cable slings; power for seating came from tower-mounted winch rather than hand crabs.



JOINT IS CRITICAL DESIGN FEATURE in any ocean outfall. The special design of this joint includes bolted cast-iron clamps against cast-iron seats embedded right in the concrete.

Pennsylvania water demand amounts to 11 billion gpd

Pennsylvania used a daily average of 11 billion gallons of water during 1951 and—according to a recent Geological Survey report—probably leads all other states in consumption of fresh water for requirements other than irrigation.

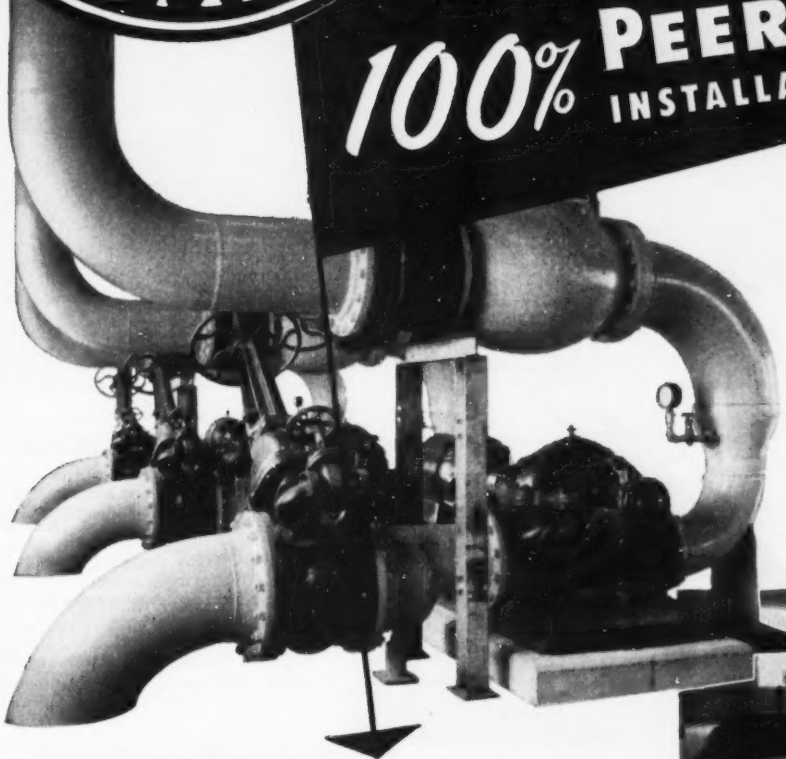
Public supply systems, the majority utilizing wells and springs, furnished 1,319 mgd or 12% of the total water used. Over 90% of the municipal supplies came from streams and lakes.

Industry—averaging 9,724 mgd—called for more than 90% of all water used in the state and drew about 97% of it from surface water—most of this from industry's private water supplies; the rest was purchased from public systems. As a sidelight, USGS reported that industrial production in 1951, according to the state's Department of Internal Affairs, amounted to over $23 billion—three times the 1941 figure. During this same period, there was an estimated twofold increase in total water use.

Water for rural-domestic use, taken from privately-developed ground water sources, averaged 92 mgd. Five counties—Allegheny, Philadelphia, Delaware, Westmoreland and Beaver—accounted for 61% of all water withdrawn.

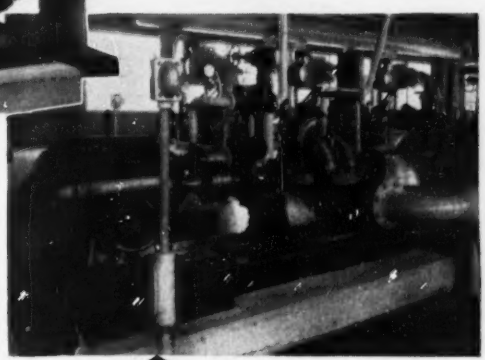
PEERLESS PUMPS

NATURAL GAS PIPE LINE COMPRESSOR STATIONS' COOLING WATER PUMPS ARE 100% PEERLESS INSTALLATIONS

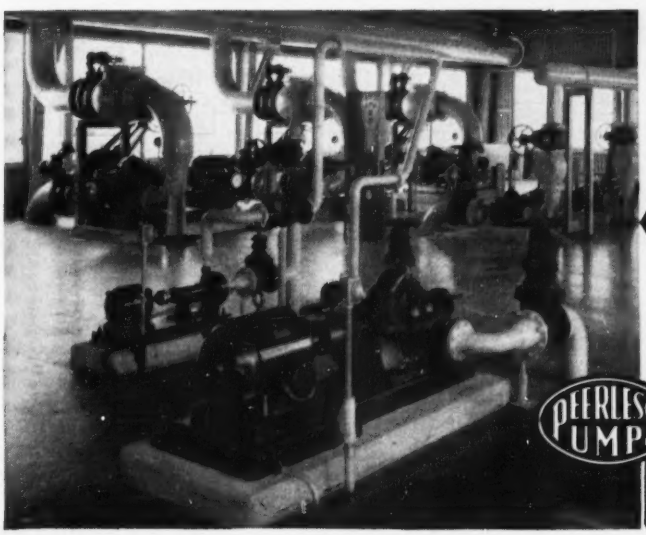


One of the most recently completed natural gas pipe lines runs from Texas to Illinois. Views here show a 100% installation of Peerless pumps in one of the typical 10,000 hp compressor stations now in operation on this line. Pumps are installed in parallel batteries to handle water flow through dual cooling units. One unit cools jacket water, the other unit cools water used in heat exchange units of the lube oil cooling system.

PEERLESS SINGLE STAGE & MULTI-STAGE HORIZONTAL PUMPS HANDLE WATER TO STATIONS' DUAL COOLING UNITS



View above shows typical station arrangement of Peerless pumps installed in one of the compressor stations on the line. Single stage Peerless Type A and multi-stage Peerless Type TU pumps, both of horizontal split case design, are used to handle water to cooling systems.



View at left shows one of the multi-stage Peerless Type TU horizontal split-case pumps installed in these stations. Ample overload capacity is provided so that one or more pumps in each battery can be shut down without impairing cooling water circulation.

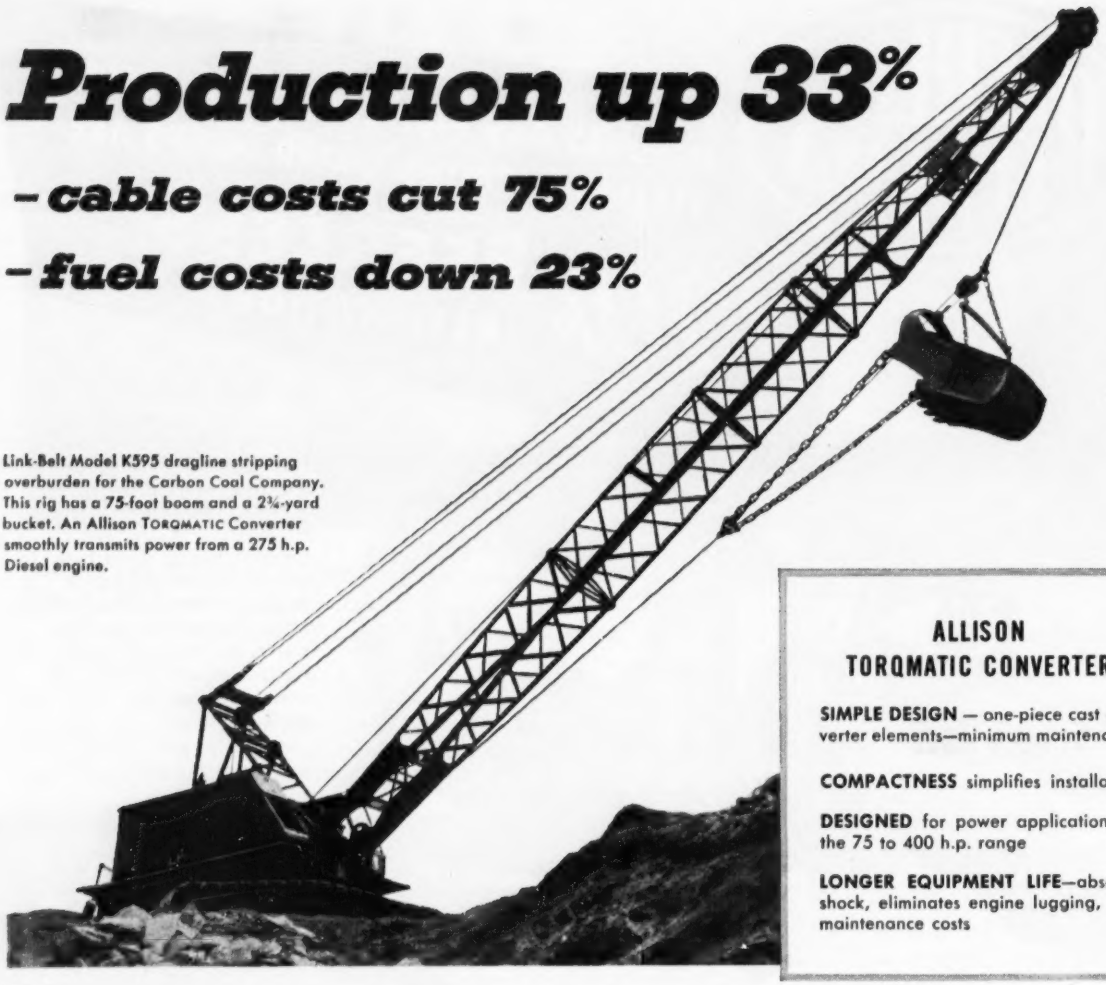
Write today for descriptive engineering Bulletins on both Type A and Type TU Peerless pumps.

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Address inquiries to Factories at:
Los Angeles 31, California and Indianapolis 8, Indiana
Offices: New York, Chicago, St. Louis, Atlanta; Dallas, Plainview and Lubbock, Texas; Fresno, Los Angeles; Phoenix, Albuquerque, N. M.; Tulsa

Production up 33%

–cable costs cut 75%

–fuel costs down 23%



Link-Belt Model K595 dragline stripping overburden for the Carbon Coal Company. This rig has a 75-foot boom and a 2¾-yard bucket. An Allison TORQMATIC Converter smoothly transmits power from a 275 h.p. Diesel engine.

ALLISON TORQMATIC CONVERTER

SIMPLE DESIGN — one-piece cast converter elements—minimum maintenance

COMPACTNESS simplifies installation

DESIGNED for power applications in the 75 to 400 h.p. range

LONGER EQUIPMENT LIFE—absorbs shock, eliminates engine lugging, cuts maintenance costs

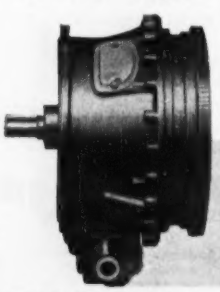
Here's another operator who's boosting production and cutting costs with Allison TORQMATIC DRIVES: The Carbon Coal Company operates two Link-Belt draglines, strip-mining coal near Grove City, Pa. The units are nearly identical—one has an Allison TORQMATIC Converter, the other is direct-driven—but there's a big difference in operating costs and production.

The Allison Converter absorbs shock loads so dragline cable on the TORQMATIC-equipped unit lasts four times as long, *saving $2160 a year on cable alone*, a reduction of 75%.

The TORQMATIC-equipped unit strips a 60x40x25 foot "lift" of overburden in 24 hours against 32 hours for the direct-driven unit, a 33% increase in production. A comparison of daily fuel records shows the friction drive unit consumes 130 gallons while the Converter-equipped unit uses only 100 gallons, a cut in fuel costs of 23%.

The TORQMATIC-equipped unit has rolled up such an impressive performance record that this operator intends to specify TORQMATIC DRIVES in all his new heavy-duty equipment. You, too, can cut your costs by specifying Allison TORQMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

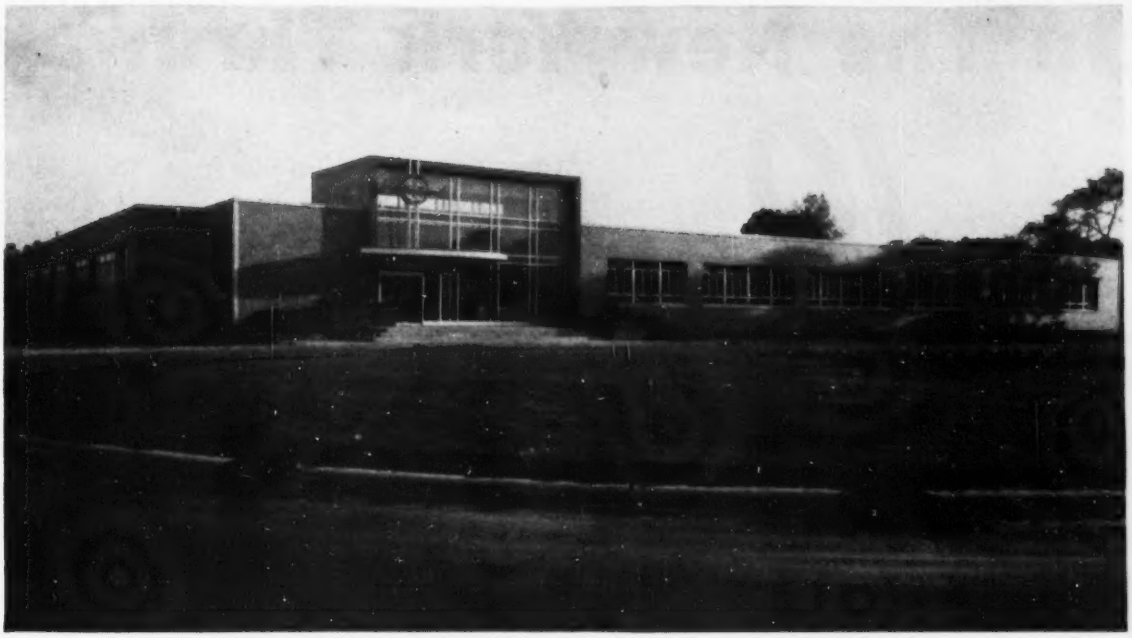
ALLISON DIVISION OF GENERAL MOTORS
Box 894EE, Indianapolis 6, Indiana



Allison **TORQMATIC DRIVES**

GM GENERAL MOTORS

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES • TRUCKS • TRACTORS • SCRAPERS • SHOVELS • DRILLING RIGS



LABORATORY structure, in Skokie, Ill., embodies a number of design economies which have proved satisfactory in service. The $175,000-one-story building has a partial basement and provides extensive research facilities and office space.

Money-saving design featured in laboratory

Several cost-cutting schemes were adopted for a new laboratory with year 'round air conditioning in Skokie, Ill. Built for the International Minerals & Chemical Corp., the one-story building is the central research plant for the firm.

The laboratory provides 33,500 sq ft of floor area, and was built at a total cost of $750,000. Cost average is $22.39 per sq ft of floor area for the whole plant, which includes offices, laboratories, corridors, service areas, building equipment, and engineering and laboratory furniture.

• **Money savers**—Chief among the steps taken to keep costs down without impairing quality are use of:

• Bolted connections and light steel shapes for the building frame.

• Metal roof decking in the main-floor laboratory areas. The underside of the roof deck was painted to form the ceiling.

• Concrete block partitions (made with expanded-shale aggregate). The block walls were painted, thereby eliminating the cost of plaster.

• Standardized doors, bucks, windows, laboratory furniture, and building service equipment connections and machinery.

• Pipe gallery for the laboratories in both the basement and first floor in the upper part of the basement corridor.

• Movable metal partitions in office areas for flexibility in future changes.

• Acoustical tile suspended on a grid that supports recessed fluorescent light fixtures in ceilings for offices and most corridors.

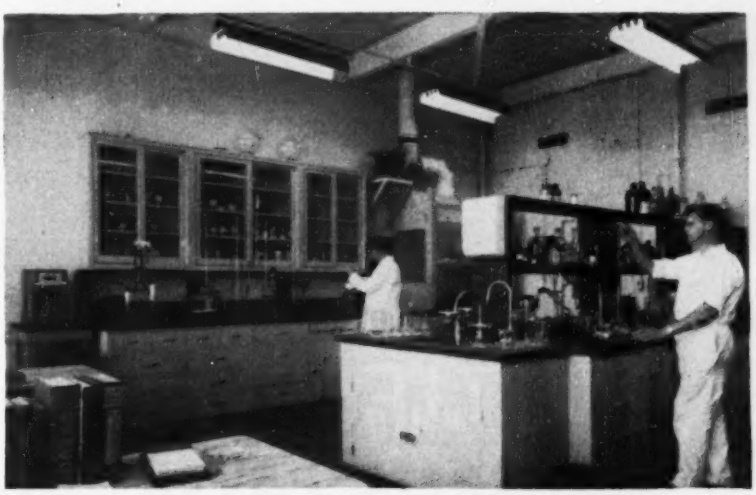
• Electrical conduit, plumbing lines, air ducts, and exhaust systems exposed, except in offices and main-floor corridors. This saved a great deal of time and labor in construction.

• Air-conditioning equipment that provides heated air in the winter to supplement heating from finned-tube convectors supplied with steam from oil-fired, factory-built boilers.

• A partial basement. This gave the economy of basement construction, when it was suitable.

As a whole, the building was planned to keep the length of piping as short as consistent with laboratory needs.

The H. K. Ferguson Co., Cleveland, Ohio, designed and built the laboratory.



TYPICAL 4-MAN LABORATORY ROOM required no plaster. Ceiling, formed by the metal roof deck, and lightweight-block walls are painted.

On The New York Thruway

10 MULTIFOOTE PAVERS

HERE'S another MultiFoote Road! There are 10 MultiFoote Pavers on the New York Thruway! That's a *number* to remember—and when you look over the names of the contractors that own them it is a number to think about when you are planning for equipment on your own paving work.

The simplicity of design, the easy accessibility and the speed of the MultiFoote have been responsible for more than one paving record.

Collins Brothers, Utica, N. Y.
2 MultiFoote Pavers

Savin Const. Corp., Hartford, Conn.
2 MultiFoote Pavers

Mayersohn Const. Co., Verona, N. Y.
1 MultiFoote Paver

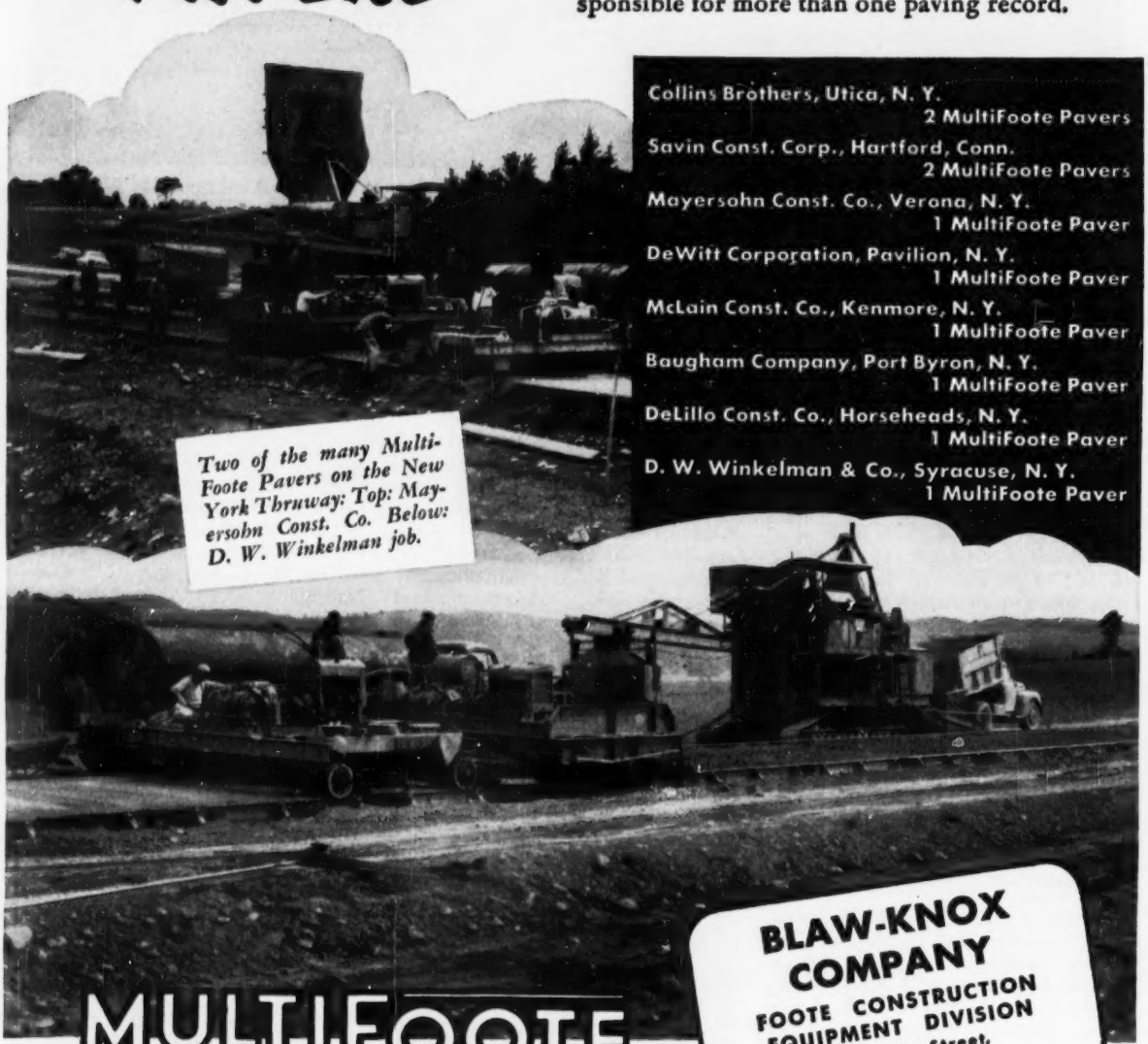
DeWitt Corporation, Pavilion, N. Y.
1 MultiFoote Paver

McLain Const. Co., Kenmore, N. Y.
1 MultiFoote Paver

Baugham Company, Port Byron, N. Y.
1 MultiFoote Paver

DeLillo Const. Co., Horseheads, N. Y.
1 MultiFoote Paver

D. W. Winkelman & Co., Syracuse, N. Y.
1 MultiFoote Paver

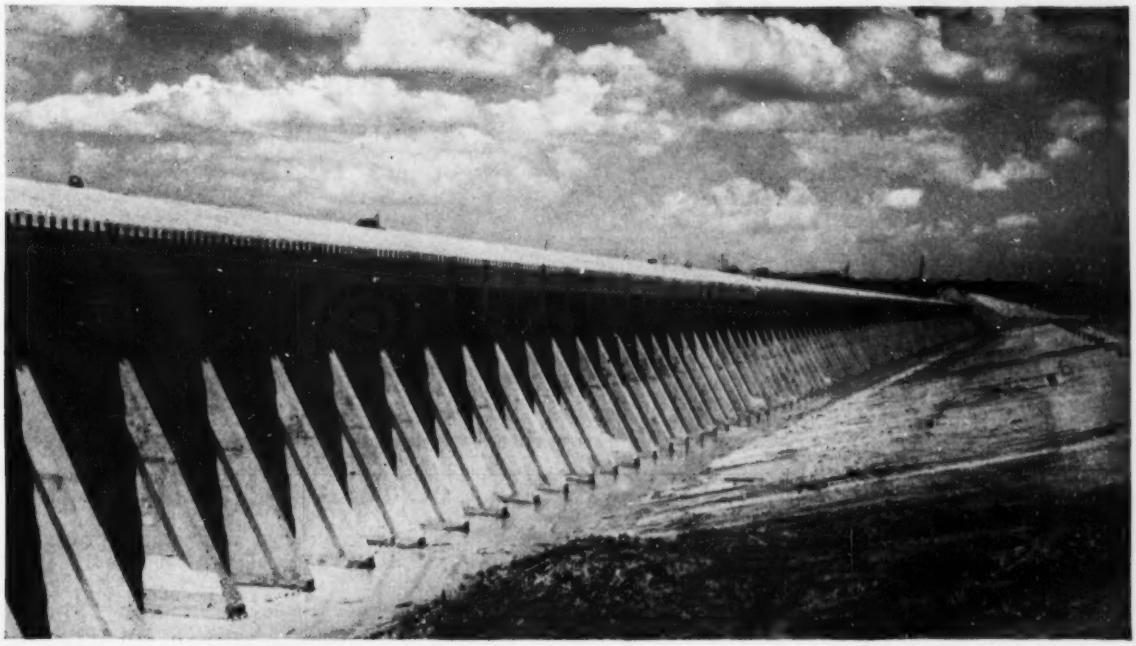


Two of the many MultiFoote Pavers on the New York Thruway: Top: Mayersohn Const. Co. Below: D. W. Winkelman job.

MULTIFOOTE
CONCRETE PAVER

BLAW-KNOX COMPANY
FOOTE CONSTRUCTION EQUIPMENT DIVISION
1922 State Street,
NUNDA, NEW YORK

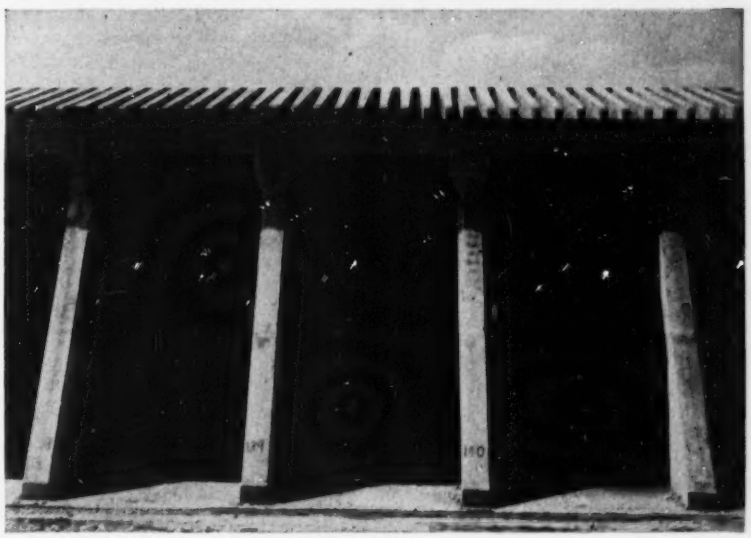
BLAW-KNOX



Lightweight dam to pass heavyweight flows over new diffuser spillway

A low concrete dam pressing only a ton per sq ft on its none-too-stable soil foundation and passing up to 525,000 cfs over its novel diffuser spillway will create Houston's new 160,000-acre-ft reservoir on the San Jacinto River.

It is a slab-and-buttress (Ambursen) dam set on soft, yielding foundation material. Through its entire 3,160-ft length, the 45-ft high concrete structure is built as one long spillway. It will spread out flood flows and diminish their erosive effect on the sandy flood plain downstream. Dissipation of the river's energy will be achieved by the special crest design in this, its first application.



• Foundations determined dam type—Deep alluvial deposits, typical of the Gulf Coastal prairie, underlie loose sandy valley floor that extends from about El. 22 to sea level. The 20-ft blanket of pervious sandy material ranges from fine silty sand at the top to medium clean sand at the bottom, and it lies over reasonably impervious clay-like deposits, the first encountered being a 10 to 15 ft layer of hard friable red clay. A layer of varved clay about the same thickness lies between the red clay and thick, formations of Beaumont clay.

The consulting engineers were confronted with the problem of designing a dam for a soft, yielding foundation and preventing seepage under the dam. In addition, the spillway of the dam had to be designed to pass frequent overflows in such manner that the discharges would not erode the sandy flood plain below the dam and thus endanger its foundation.

The Ambursen type dam with patented diffuser spillway was selected is the basic structure. (Earlier ENR issues carrying stories on the Ambursen dam: Oct. 16, 1930, and June 8, 1939.)

The structure is based on the red clay stratum at El. 0.0, or mean sea level; the pervious sandy overburden was excavated to a depth of about 20 ft to provide this suitable foundation. A heavy reinforced concrete floor, conventional with the Ambursen type of soft-foundation dam, forms the base of the spillway, supported (up to 2,000 psf) by the red clay. On this mat the superstructure of the spillway dam is constructed to crest El. 44.5, or about 24 ft above the

MODEL STUDY proved what diffuser crest on spillway would do. Normal spillway nappe is pretty well broken up when it hits surface of stilling basin under slab-and-buttress after passing through diffuser.

level of the original valley floor. Steel sheetpile cut-off walls at both upstream and downstream edge of the thick floor slab penetrates into the clay foundations to about El. −45 upstream and −25 downstream to prevent under-seepage through the foundation.

From the downstream edge of the foundation slab an inclined reinforced concrete hearth slab extends downstream for a distance of 110 ft, sloping upward for the downstream 90 ft of its length to El. 22 (the natural level of the valley floor). This hearth slab forms a stilling basin about 21 ft deep, into which discharge from the spillway will fall. A steel sheetpile cut-off wall of high section modulus is driven at the downstream end of the hearth slab to prevent scouring action there from undermining the slab.

Superstructure of the dam is a conventional slab and buttress type, triangular shaped buttresses of reinforced concrete, spaced on 20-ft centers, supporting on haunches on their sloping upstream edges an inclined deck slab of reinforced concrete. The buttresses and slabs are designed for repetitive use of the concrete forms.

• **Diffuser grill at dam crest**—The crest of the spillway has a novel overflow diffuser, a grill of large, reinforced concrete, tapered girders. Flood waters will drop vertically through this grill in narrow sheets into the stilling pool, where energy of the overflow water will be dissipated. Water will flow quietly away from the dam over the inclined pavement of the hearth and continue downstream over the natural valley floor in times of flood.

The diffuser girders are designed for effective distribution and aeration of the overflowing nappe, so that excellent energy dissipation for all ranges of discharge will be had in the basin.

The tapered diffuser girders are sharply pitched downstream. Primary purpose of this slope is to shed drift and debris moving downstream over the grill. Likewise, the tapered girders are wide at their upstream ends, where they join the concrete crest, and much narrower at their downstream end; wider at their tops than at their bottoms—all for the purpose of keeping drift from hanging up in the grillage.

Hydraulic model study of the new spillway, made in the laboratory of the University of Iowa Institute of Hydraulic Research, confirmed design computations and showed the spillway crest girders effective for

The overall water supply project

San Jacinto River Water Project, scheduled to be finished by the end of this year, will end complete dependence on ground water for booming Houston, Tex. And it will end 20 years of planning and waiting.

Planning has been the responsibility of the city's Utilities Department under Frank N. Baldwin, director, and his assistant W. K. Van Zandt. And plenty of outside engineering talent has been applied to the problem of augmenting Houston's well supplies.

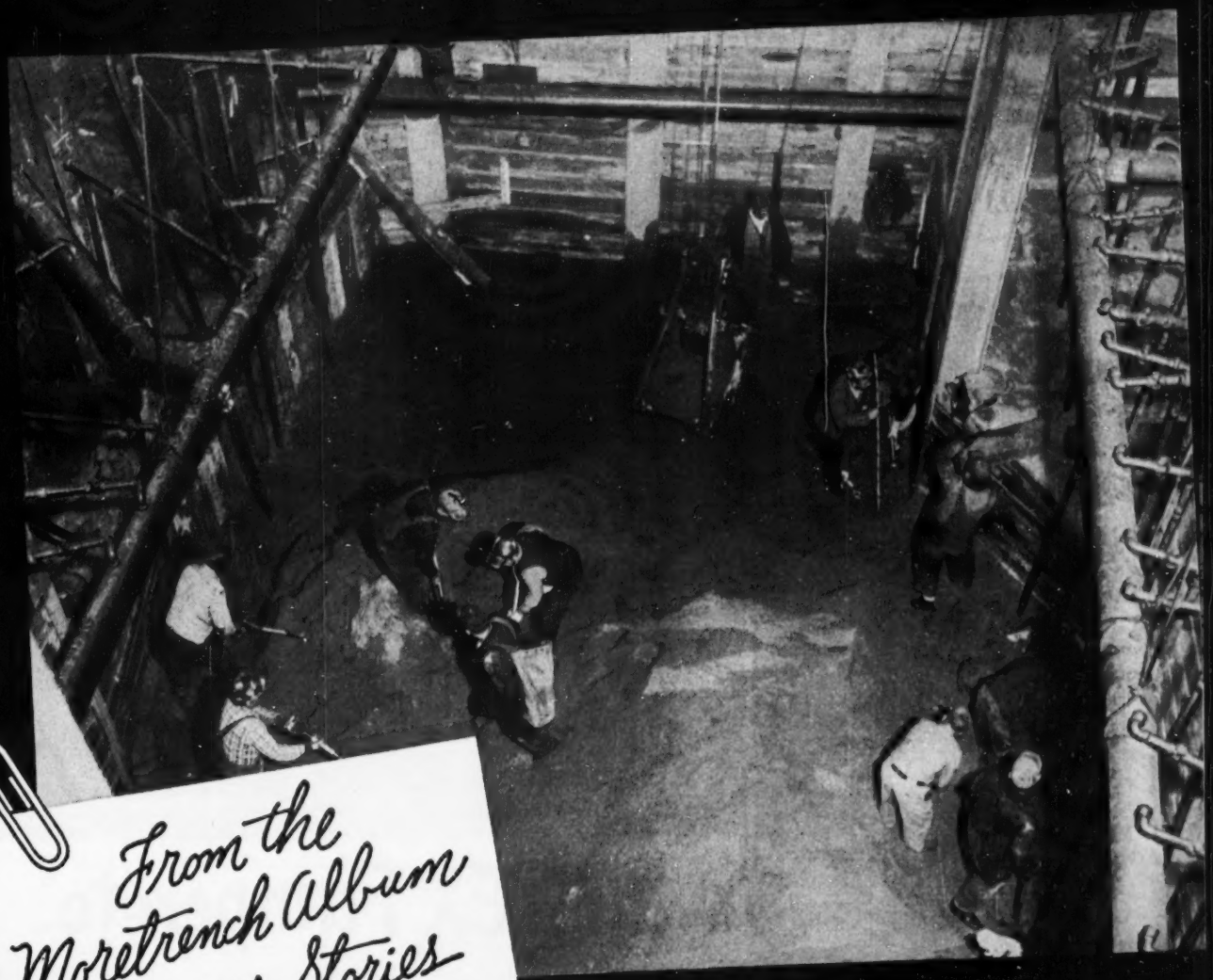
Quite early in the search for surface waters Alvord, Burdick & Howson, of Chicago, were consulted; Horner and Shifrin, St. Louis, were also engaged. Now that the whole $30-million storage-transmission-purification project is about winding up there are three more major firms involved:

Ambursen Engineering Corp. of New York and Houston, designed and is supervising construction of the dam. Lockwood and Andrews, Houston, has the intake tower and bridge, intake conduits, river pumping station, concrete-lined canal from dam to treatment works and transmission main from the plant into the distribution system. Freese, Nichols & Turner, also Houston, is handling the 50-mgd waterworks and its two pumping stations.

What this array of engineering brain-power came up with is a large reservoir on the San Jacinto about 18 miles northeast of the city, at a point where Houston is already pumping 40 mgd from the channel as an interim industrial water supply. The new reservoir will have a safe yield of 140 mgd, about half of which is still intended to be supplied raw to industry (See "Houston's boom is a steady roar", ENR July 27, 1950, p 33).

Across the broad, flat, sandy depression that is the San Jacinto's course in the coastal plain north of Houston, the 11,460-ft dam is over 90% finished. Pumping facilities for transmission of water from reservoir to city are one-third completed. Construction work on the purification plant is more than 55% complete.

This article, first of a series of two, describes novel features of the dam, an Ambursen type with a new spillway crest design. The article to follow will cover problems of rebuilding a transmission canal without stopping transmission; economies of steel structures and outdoor construction (fashioned from industrial designs) in water treatment works.



From the Moretrench Album of Success Stories

PROJECT: SUBWAY EXCAVATION — Route 110C — Track 11
Brooklyn, New York
Contractor: Cayuga Foundation Corp., New York

CONDITIONS: Fifteen feet of water in material consisting of clay layers over coarse sand and small gravel.

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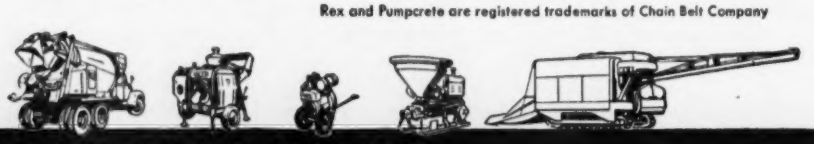


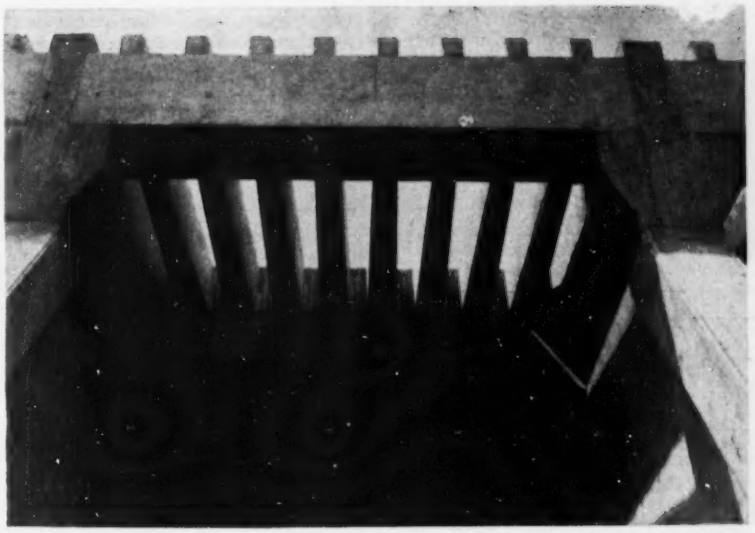
CONSTRUCTION MACHINERY

MOTO-MIXERS MIXERS PUMPS PUMPCRETES PAVERS

all ranges of discharge. Laboratory tests showed that a portion of the flow falls through the slots in the grill and retaining form of a weir nappe; a portion flows down the grillage and off the sides of its girders in sheets; a very small portion of the flow reaches the downstream end of the girders and goes off in the form of a jet.

Design computations indicated that up to 320,000 cfs would pass through the grill and drop vertically into the stilling pool; greater discharges would reach the downstream ends of grillage girders. Laboratory tests later confirmed that actually 300,000 cfs would discharge through this diffuser before water in effect overflowed the grill. (230,000 cfs is the largest flood of record although the spillway was designed for almost twice that.)

Laboratory tests also showed that under all conditions of flood up to complete submergence of the spillway, there was always sufficient entrained air in the over-pour through the grill to prevent any negative pressure or vacuum under the deck and crest beam of the dam.



DIFFUSER GRILLAGE seen from downstream in the stilling basin has its reinforced concrete members tapered in width from top to bottom and upstream end to downstream and so that it won't clog with drift.

• Stilling basin at foot—As a final precaution against downstream scouring, the dam was designed so that the most frequent overflows will be carried laterally through the stilling basin to a low-flow discharge channel, located at the east end of the spillway and extending to the river about 3,200 ft below the axis of the dam.

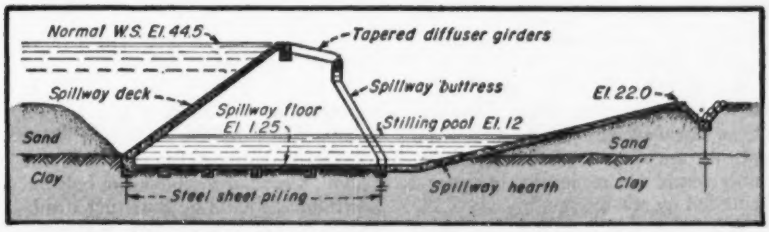
This low-flow discharge channel has a bottom width of 200 ft and a carrying capacity of about 12,000 cfs. It is paved for a distance of about 450 ft below the dam. At the entrance to the channel the downstream end of the hearth slab is at El. 12, or 10 ft lower than it is for the remainder of the spillway. Low flows (to about 12,000 cfs) will be confined to the trough formed by the stilling pool and conveyed laterally to the entrance of the low-flow channel. As the channel approaches its design capacity, its back-water will begin to flood the plain below the hearth. Discharge over the dam will have its tendency to scour reduced by flowing into this channel backwater.

Under the condition of maximum flood discharge, tailwater below the dam will rise to El. 47 ft, or 2.5 ft above the crest of the spillway, and thus submerge it. Ordinary flood flows, however, will pass over the spillway with a head of less than 2 ft and produce backwater several feet deep across the valley floor below the stilling pool.

• Earthfill sections—The non-overflow or abutment sections of Lake Houston Dam are earthfill embankments. Reinforced concrete non-overflow Ambursen sections of dam at each end of the spillway are buried in the embankments to form safe transition between spillway and embankment. The east embankment is 3,600 ft long; the west embankment is 4,700 ft long. Tops of the earth embankments stand at El. 63.

The embankments were designed to make use of materials from the spillway excavation; they have an impervious core of selected clay-like material and an outer shell of pervious sandy material. The fill is compacted to 95%. Top width of the impervious core is 14 ft; side slopes are 1 on 1. It is deeply entrenched below the natural ground surface and envelopes the top of a continuous row of steel sheetpiling penetrating the clay-like formations below. Steel cut-off walls under the embankments connect to the principal cut-off wall beneath the concrete spillway and form a continuous watertight barrier across the entire valley. The side slopes of the embankment (1 on 4) are being protected by heavy, graded riprap dumped 18 in. thick on a 9-in. gravel blanket. The upstream slope will be protected for its entire height, and the downstream slope will be protected to El. 50, 2.5 ft above tailwater elevation for the maximum flood. Above this it will be sodded.

To keep water moving in the stilling basin and to satisfy riparian rights below the dam, a 36-in. hand-operated sluice gate is built into the spillway structure at the west abutment. Two tainter gates 20.5 ft high by 18 ft wide and two hinged steel flashboards 18 ft long and 6 ft high are also in the spillway—these for special purposes. The tainter gates are to be used to vary the level of the reservoir surface frequently during mosquito breeding season. The hinged flashboards provide a means of skimming trash and drift from the surface. Both gates and flashboards will be operated by individual stationary hoists.



TYPICAL SPILLWAY SECTION shows construction of slab-and-buttress dam.

• Economies recorded—Houston Dam was advertised for bids during Nov., 1951; bids were received in December; and the contract was awarded Jan. 18, 1952. By purchasing directly nearly $2 million worth of critical materials beforehand, the city considerably advanced the completion date and also made a very large cash saving, as well as attracting additional bidders.

(Continued on page 48)

In another economy move, consulting engineers recommended to the city that the customary blanket item of "cofferdams, pumping and diversion and care of river" can be eliminated from the bid sheet; that the engineers design and specify the type and scope of cofferdaming; and that the city accept full responsibility for its adequacy. (In 1946, on a different type of structure for the same site, only four bids were received, and the lump sum price set for the cofferdamming and unwatering item averaged $413,000.) With the city calling for cofferdams as common fill dikes, the successful contractors bid price was 20¢ per cu yd; removal price was 70¢ per cu yd; total cost of all cofferdams and diversion works was reduced to about $40,000.

Of seven bids received in December, 1951, the four lowest bids (all from Texas contractors) ranged from $6 million to a little over $6.5 million, compared to the engineer's estimate of $6.38 million. The close competition was attributed to the fact that the city of Houston assumed all responsibility for procuring the then critical items, reinforcing steel, sheet steel piling and other metals. A joint venture of San Jacinto Equipment Co. and Elmer C. Gardner, Inc. was low bidder with a total contract cost near $6,217,000. Adding what the city has spent on material and equipment items, the total cost of the dam comes to near $7.9 million.

Contract time for completion of the dam is about 23 months, the completion date being Dec. 31, 1953. It appears that no difficulties will be encountered in maintaining the schedule. Closure is planned for August when flow of the San Jacinto is minimum.

During the closure operation, stream flow will be diverted from the river through a short diversion channel and discharged through openings left in the concrete deck slab of the dam near the head of the low-flow discharge channel. Fifteen openings are provided for handling flood waters during construction and for closing the dam when the structure is completed.

Openings are at different levels, all at or below the natural level of the valley floor. Seven are temporary openings with an effective height of 7.5 ft and a width of 18 ft. These temporary openings are at the highest elevation and will be closed by placing high-early-strength concrete directly into forms. The remaining eight openings have an effective height of 5 ft and a width of 18 ft and are at an elevation below the level of the flood plain. These eight closure bays are equipped with sliding closure slabs of reinforced concrete so that if necessary they can be closed under high river flow conditions.

The sliding closure slabs are preformed by casting them in place in the exact positions where they will lie when final closure is made. After the slabs have set they are freed from their position and slid upon the upper part of the deck of the spillway. Special horizontal concrete seats or haunches are constructed as part of the deck below the bottom of the deck openings to receive the deck slab when it is finally slid into place. Coal tar mastic is used to assure a water-tight seal. This method of making final closure is a conventional feature for Ambursen type dams.

Sewage lagoons—

Low-cost treatment and disposal method

William J. Wenzel
Consulting Engineer
Great Falls, Montana

Sunshine, wind and wide open spaces—that's all North Dakota has found it takes to treat sewage. No concrete and steel structures, full of machinery, controlled by an increasing number of automatic gadgets. Just lagoons; simple and cheap.

Advantages of the sewage lagoon go beyond low first cost. There is also the matter of operation to consider. Operating costs and troubles in the average small community can be even worse than troubles of construction financing.

In fairness to the small town handyman-sewage plant operator, with his many other duties—sometimes including the jobs of town marshal, dog catcher, and driver of the garbage truck—the design engineer should restrain himself from imposing such exacting tasks as repairing electrical relays and operating a chemistry set. Experience has shown that in the majority of towns and small cities where I have designed sewage treatment plants of the conventional type, operation and maintenance are below the standards necessary for best results.

It was to overcome the objections of high construction, operating, and maintenance costs of conventional plants that the lagoon method of sewage disposal was developed. It is not new. It was pioneered in the State of North Dakota largely through the enlightened efforts of the North Dakota State Department of Health, where the first lagoon, at Fessenden, has been in operation since 1928.

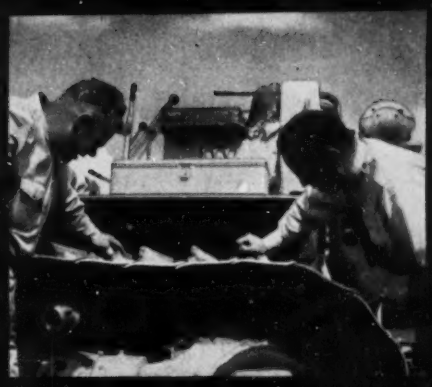
• **Complete treatment**—The process consists simply of discharging sewage into open earth basins, where, under the action of sunshine and wind, the biological processes of nature render it harmless and inoffensive. Construction costs are small, and operating attention required is almost none. Purification accomplished matches that of expensive secondary treatment plants. A clear, well-stabilized effluent practically free of pathogenic organisms is the result, and can be discharged into a flowing stream with no health hazard. In many lagoons now operating in North Dakota, evaporation and percolation dispose of the effluent; no run-off results. No objectionable odors develop.

A report by the North Dakota Department of Health states, "the observer can walk around the dikes and note no nuisance conditions, and certainly would not recognize this area as being fed by raw sewage."

Why this old method has been neglected in modern times is probably a matter of fashion. Perhaps the method has appeared too crude to appeal to the engineer; nothing about the process is available for the sales promotion of the equipment suppliers. It has been used to some extent in the warm, dry climate of the southwest United States, sometimes in connection with sewage irrigation, but in northern climates, where ice covers ponds for three or four months of the year, it has not been used much elsewhere than in North Dakota.

• **All it takes**—Requirements for successful treatment of domestic sewage by lagoons are sunshine, wind and cheap land. In the Great Plains, from the Red River of North Dakota to the Rocky Mountains, these conditions are found in abundance.

It is recommended that a lagoon area of 10 acres per 1,000 population be provided, one-half mile or more out of town, preferably to leeward from the prevailing wind. Water depth should be no less than 3 ft, to prevent emergent vegetation; not more than 5 ft, to permit sunlight to penetrate to the bottom and to permit good mixing by wave action. Sewage should enter at the center of the lagoon, a foot or so above the bottom. Earth dikes should be constructed substantially, of impervious materials, watered and compacted in layers. Top



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Sewage lagoons—(continued)

width should be 8 or 10 ft and slopes, sufficiently flat to provide stability, should be covered with native grasses to inhibit erosion.

Lagoons can be of any shape that fits the topography of the site, but it is important that the water surface be exposed to the clear sweep of the wind, to promote aeration. A spillway or overflow structure should be provided, even though no runoff is anticipated. The area should be fenced.

Screening or grinding of the sewage, and grit removal are complications not justified in this kind of installation, where the aim is to keep everything as simple as possible. They may be desirable ahead of a pump station, should sewage pumping be required. No objectionable floating material has been observed in the North Dakota lagoons now in operation.

• **How it works**—With an average domestic sewage flow of 80 gpcd, a lagoon area of 10 acres per 1,000 population and a 5-ft water depth, retention time is approximately 200 days. Time required to build up a 1-ft deposit of sludge in the lagoon will be near one hundred years; therefore, no sludge removal apparatus is required. With an average net evaporation of 24 in. per year and a percolation rate of ¼ in. per day, the inflow will be balanced by evaporation and percolation, and no effluent will be discharged—although the water level will rise during the winter months when ice cover prevents evaporation.

Aeration is difficult to compute, but experience shows it is ample. Winds sweeping over the water surface double normal oxygen absorption by destroying interfacial films that obstruct the transfer of oxygen. Waves ruffle the surface and stir circulation of water. The larger the clear sweep, or fetch, of the wind, the greater is the effect of wind-induced waves and currents. Waves may increase the absorption tenfold and whitecaps may increase it a hundredfold by droplet aeration.

Creation of conditions favorable for oxygen absorption, namely large surface and change of surface, is a fundamental principle of all biological sewage treatment processes. In warm weather and sunshine, algae grow profusely in these lagoons, supplying large amounts of additional oxygen, promoting biological activity, so that the rapid breakdown of organic matter in the waste water is assisted by the oxygen supplied by the algae. For these reasons, a super-saturated oxygen condition is found all through the summer months. In winter, ice cover forms over the ponds, biological activity comes to a stop, and the long retention period of lagoons holds the wastes in storage until activity resumes in the spring.

Operation and maintenance is simple, indeed, compared with the attention required by a conventional sewage treatment plant. An adequate fence must be maintained around the area to keep out large animals, which might damage the dikes; weeds should be mowed, so that wind action is not reduced; the dikes should be inspected and repaired periodically to prevent damage by bank rats and other rodents.

• **Endorsement**—There are now seven communities in North Dakota operating sewage lagoons; Maddock, Portland, Grenora, Butte, Hope, Fessenden and New Town. The oldest, in operation for 24 years, shows no indications of filling with sludge or of reduced percolation. In every case operating results have been excellent; no complaints have been received from neighbors; no harmful results have been observed. The North Dakota Department of Health in its official Bulletin endorses this method of sewage treatment:

"During the summer the Maddock lagoon has shown consistently a BOD or organic strength removal from the sewage of 95%. This is equivalent of tertiary treatment and is equal to that of any type of conventional plant which we have in the State of North Dakota.

"After the lagoon has been in operation a few years, the dikes become covered with vegetation and the water in the lagoon becomes rich in plant and animal life of all types. Water fowl and shore birds find abundant food supplies in and around the lagoon . . . a sewage lagoon becomes a very fine wildlife habitat. In the vicinity of 10 acre Maddock lagoon this summer about 1,000 birds are making their homes.

"This department believes that the lagoon is a cheap and satisfactory method of disposal of sewage for a small community and no doubt would work on a larger scale with increased flow if adequate storage capacity were provided."

As the ultimate endorsement of the unobjectionable aerobic environment of these lagoons, the Fish and Game department of North Dakota has asked permission to use some of them as rearing ponds, planting small fish in them in the spring and taking them out in the fall.

• **More coming**—A number of new city sewage treatment lagoons are under construction or planned in the Northwest. The largest is in the city of Jamestown, North Dakota (pop. 15,000) under the supervision of Erik D. Peterson, city engineer. The city recently purchased 600 acres for this purpose, on a bench, 80 ft above the city, to which the sewage will be pumped.

State sanitary engineers from half a dozen midwest states inspected North Dakota lagoons during the month of June.

Claiborne Brinck, director, Division of Environmental Sanitation, State Board of Health, Montana, has given sewage treatment lagoons his approval, after investigation of existing installations in North Dakota.

Much valuable information on sewage lagoon experience was received from Jerry Svor, state sanitary engineer, and W. Van Heuvelen, director, Division of Water Pollution Control, North Dakota State Department of Health, who should be credited for promoting this unorthodox, unadvertised, but economical process.

Plentywood, Mont., has advertised for bids for construction of a sewage lagoon I designed for a population of 3,000. It is believed that more of such plants will be built in the Northwest; they appear to overcome for the cities many of the objections to the more conventional types of plants. For the engineer they offer an opportunity to do this traditional job: to do well for one dollar what any bungler can do for two, after a fashion.

N. Y. tries private control of public housing projects

Seeking a higher degree of efficiency and greater economy in construction, operation and maintenance, the New York City Housing Authority has engaged an engineering firm to survey its management and construction problems, it has been announced by P. J. Cruise, NYCHA chairman.

It also was announced that the first of nine public housing projects authorized by the Board of Estimate will be managed by a real estate-management firm upon its completion sometime in the summer of 1954.

This procedure, experimental in nature, will determine relative costs of management under private control or public operation. It is the purpose of the authority, Cruise said, to place all nine projects under such private management if the pilot operation proves to be the more efficient.

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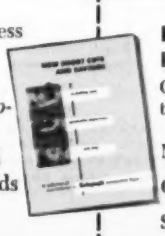

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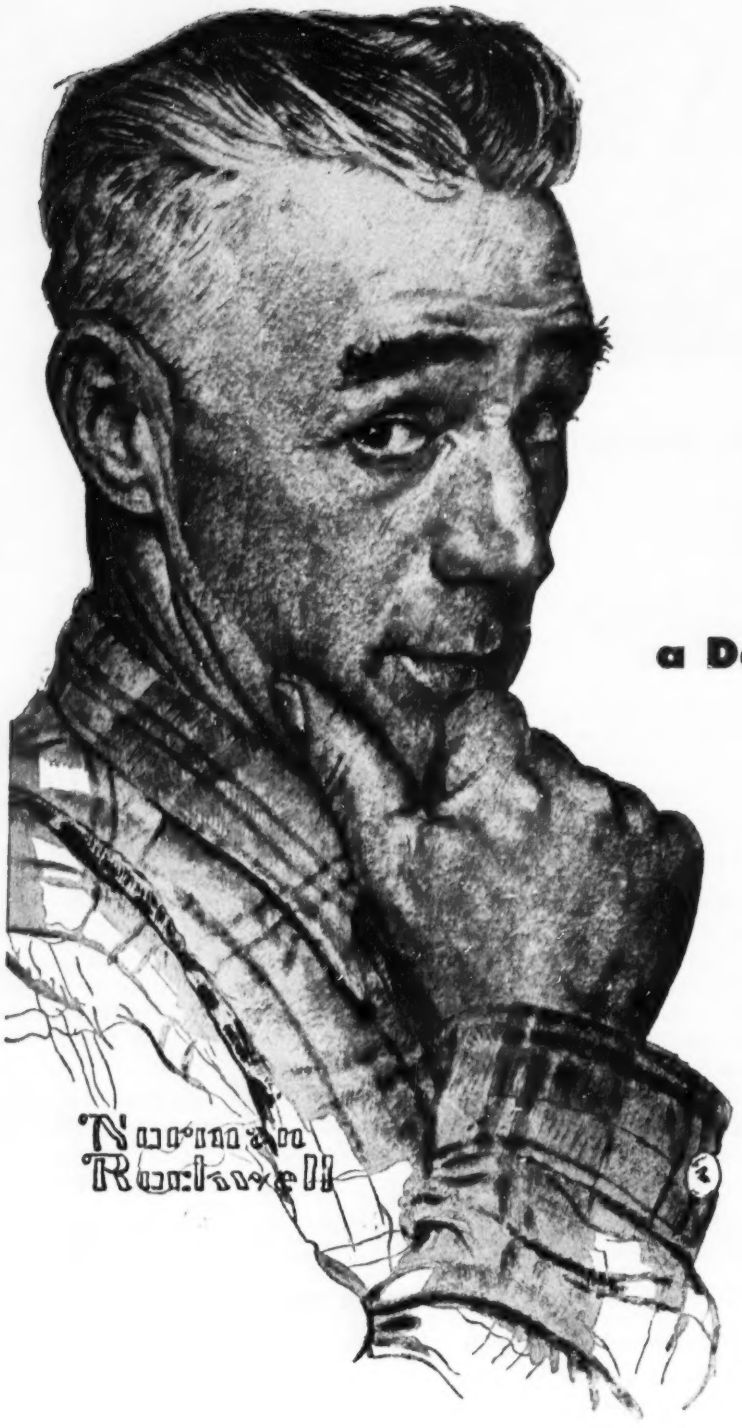

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BUILT-UP AREAS such as this section of Kansas City, which was submerged during the 1951 flood, would be given greater protection under the new flood-control plan. Farm lands would not be protected during high floods.

Reservoir plan challenged for Kansas flood control

"While flood protection by the use of reservoirs has been proved to be successful where reservoirs are located close to the property to be protected, there is no precedent for successful flood protection by reservoirs where most of the storage is a great distance from the localities most needing protection."

That statement sums up the findings of the final report of the Board of Engineers set up by the Kansas Industrial Development Commission to review the plans of the Corps of Engineers, the Bureau of Reclamation, and the Department of Agriculture for control of floods on the Kansas River in Kansas. Thus the findings stand as a direct challenge to the engineering judgment of the Army Engineers whose most recent plan for flood control on that stream calls for 36 reservoirs.

The board calls for abandonment of the reservoir building program and for minimizing flood damage in the Kansas River basin by channel enlargement and by the construction of additional levees to protect built-up urban areas. It would not protect rural areas from inundation by major floods, holding that the benefits to the land itself from such flooding offset the damage to buildings and other property.

The Army Engineers already are on record unofficially as to the inadequacy of the proposals of this Board of Engineers. Summaries of their opinions, expressed at the time the board submitted a preliminary report to the legislature in February, were given in ENR March 5, p. 21 and April 23, p. 26.

• **Board named after 1951 flood**—The Board of Engineers making this report consists of three widely known consulting engineers, Abel Wolman of Baltimore, Louis R. Howson of Alvord, Burdick & Howson, Chicago, and N. T. Veatch, of Black & Veatch, Kansas City, Mo. It was set up in September, 1952, to report on plans for control of floods in the Kansas River basin, where the flood of July, 1951, had caused $725-million damage.

That flood was the greatest one in the Kansas River basin since accurate flood records have been kept, but it may have been exceeded by a flood in 1844, for which records are almost wholly legendary, the board states.

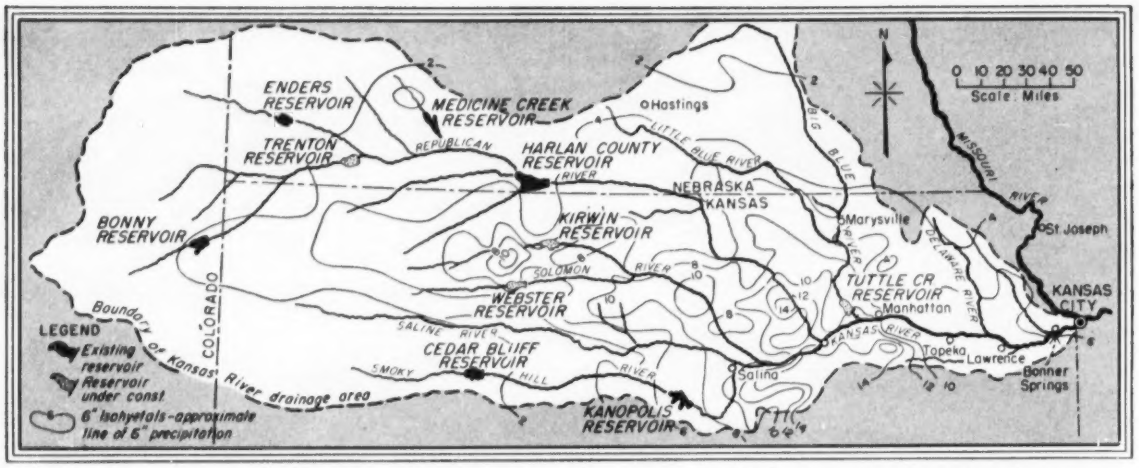
A maximum flow of 510,000 cfs was recorded at Bonner Springs, just above Kansas City, which the board states was substantially double the previously recorded high of 1903. The board adds that the 1951 flood bears a higher ratio to the Kansas River's annual flood than any flood of record on any other *major* river.

• **Flood plans restudied**—The principal tasks assigned to the Board of Engineers were a review of existing plans for control of floods in the Kansas basin in the light of this new flood record and to recommend a new plan if existing plans appeared to be inadequate or too costly. Critical attention was to be given to the many reservoirs called for under plans developed by federal agencies because of widespread objections to building some of them.

At the time of the 1951 flood (ENR July 19, 1951, p. 23), five of the reservoirs called for under the then current plans of the Corps of Engineers and the Bureau of Reclamation had been completed. They are Kanopolis, Cedar Bluff, Medicine Creek, Bonny and Enders. The Harlan County reservoir was under construction. Construction of the Tuttle Creek reservoir had been authorized, but work on it had not been started.

Tuttle Creek is by far the largest reservoir in the Army Engineer program. It also is the most controversial, due chiefly to the large amount of agricultural land that it would take out of service. An appropriation for its construction became available in July, 1952, and work was started late that year, but since then, Congress has appropriated no money for the project.

• **Reservoirs found inadequate**—Following the 1951 flood, Major General Lewis A. Pick, then Chief of Engineers, stated that had all the reservoirs called for under the Pick-Sloan Plan been built and in service, there would have been only minor overtopping of levees and flood walls called for under



RAINFALL DISTRIBUTION in the Kansas River basin during the storm of July, 1951. Greatest concentrations of rain were in the lower parts of the valley, below most of the available reservoir sites.

that plan in the lower part of the Kansas River valley (ENR July 26, 1951, p. 25). This conclusion is emphatically contradicted by the Board of Engineers in the final report it has just issued. The board states: "Had all 18 dams included in the Pick-Sloan plan been completed and operating as designed, the 1951 flood would have inundated most of the rural areas and would have overtopped all urban levee protection works along the Kansas River from Manhattan to the Missouri River from one to three feet, and there still would have been a devastating flood along this reach of the river."

• **Reservoir plan enlarged**—The cost of the Pick-Sloan plan, the board states, would have been $400 million. Since the 1951 flood, the Army Engineers have developed an enlarged reservoir program that they estimate will add another $300 million to the cost of providing adequate flood protection.

Concerning this expanded plan the Board of Engineers says: "It is estimated that this enlarged program, now 34 reservoirs, would require the purchase of some 450,000 acres of land (equal to 50 percent of the total area flooded in the Kansas Basin in 1951) and would displace more than 1,500 farm families. The same agency [the Corps of Engineers] has under study a still further enlarged reservoir program, which includes 84 additional reservoirs. It is believed that the total cost of the reservoir program, when finally determined, will be at least $1 billion. It is our opinion that even such an enlarged program would not afford complete protection to rural areas."

• **Protection centered on cities**—Basic difference between the two plans centers on protection provided for rural areas. The Army Engineers purport to provide protection to both urban and rural areas. The Board of Engineers can see no great need for protecting rural areas and no economic justification for the cost of doing so. Hence its plan is centered on protecting urban areas by means of channel enlargements and levees. The cost of doing that is estimated at $200 million.

Concerning its decision not to attempt to provide protection of farm lands against flooding the board says "it is also true that the reservoir plan would not prevent flooding of farm lands in a major flood." And the board estimates the cost of protecting farm lands from overflow under the most recent Army Engineer proposals at $723 per acre, "or more than twice the present market value of the land involved."

"In addition to the cost factor, it is to be considered that the area of land, to a large extent the most productive agricultural land in the state, required for reservoir sites, will equal nearly one-half of the area claimed to be protected by the reservoir plan."

A channel improvement plan, the board states, can be designed to give greater assurance that it will function than is practicable with any reservoir program. It will protect areas in which occurred 76 percent of the total property loss from the 1951 flood at a cost of only 25 percent of the probable total cost of the reservoir plan.

• **Reservoir too remote**—"One of the striking lessons of the 1951 storm", the board says, "was that no small number of the basic projected reservoirs of the Corps of Engineers were above the area of maximum rainfall and runoff. In fact, the area of watershed below any reservoir included in the basic list would be approximately 6,800 square miles, the runoff from which would be totally uncontrolled."

The board also expressed grave doubt as to the possibility of being able to operate this complex system of reservoirs in such a manner as to obtain the theoretical maximum values from each reservoir.

In support of its conclusion that floods in so large a river basin cannot be adequately controlled by reservoirs, the board quotes from the findings of two other study groups. The first was from a board set up by the Corps of Engineers back in 1904 to report on the great flood of 1903 in the Kansas River which then, as now, was commonly called the Kaw River. The 1904 board found that "the scheme of controlling the great floods of the Kaw River by a system of reservoirs built primarily for that purpose is not feasible." The second report was written this year by the Missiouri Basin Survey Commission. It said: "The basic difficulty that stands in the way of effective reservoir control for the Kansas Cities is the absence of dam and reservoir sites close above the cities."

• **What the board recommends**—The board proposes a system of greatly enlarged flowways through Kansas City (Kansas), Topeka, Manhattan and Salina, and systems of levees enclosing low areas of Lawrence, Junction City, Abilene, Marysville and Beatrice as well as in some 37 smaller towns. These flowways would be designed to carry the equivalent of the peak flows of the Kansas River during the 1951 flood with suitable factors of safety. Levee crests would be three feet above peak flow levels.

A flow of this size was selected because the board found that the Harlan County reservoir (completed in 1952) and Kirwin and Webster reservoirs (now under construction), if they had

been in operation during the 1951 flood, would have had almost no effect in reducing the peak flow.

The board stresses the need for curtailing at once all work on new or partly constructed reservoirs until the entire situation can be reviewed in the light of the board's findings.

• **Work in Kansas City**—In Kansas City, Kansas—where $134 million of the total $200 million estimated cost of the work would be spent—the board proposes to set back the existing levees or flood walls on one side of the river or the other so that the width between levees would be roughly twice what it is now. No change would be made in the size of the low-flow channel, but the widened flood-flow channel would be enlarged and freed of restrictions to give it the required capacity of 512,000 cfs.

This change will require lengthening all but three of the bridges over the river to the extent of from 400 ft to 1,800 ft. Raising of several of the bridges, which was begun after the 1951 flood, has been completed or is under way.

Concerning the land required, the board says that much of it is vacant and that many of the residences and industrial establishments in that area have not been rehabilitated since the flood. Two large industries have abandoned operations.

• **Cost of land will be high**—Despite these favorable factors the total cost of land will be high, especially in the cities, and may be greater than can be financed by local governing bodies under present legal limitations. Consequently, the board recommends the creation of one or more large conservation district embracing much of the valley.

The board goes on to say that, in view of the large commitments already made by the federal government under the authorized reservoir program, it seems reasonable to conclude that Congress would agree to participate in the cost of land for this flow-way program.

• **Flood-plan control**—This flowway program, the board concludes, should be accompanied by a program for control of occupancy of the flood plains of the river. Even after the 1951 flood, it says, occupation of much of the flood plain was resumed and rehabilitation or even improvement was quite general. To prevent further encroachment and to eliminate undesirable use of the flood plain, the board recommends that some public agency be set up with power to subsidize relocation of existing encroachments and to zone against further occupancy.

Ask the man behind the gun...

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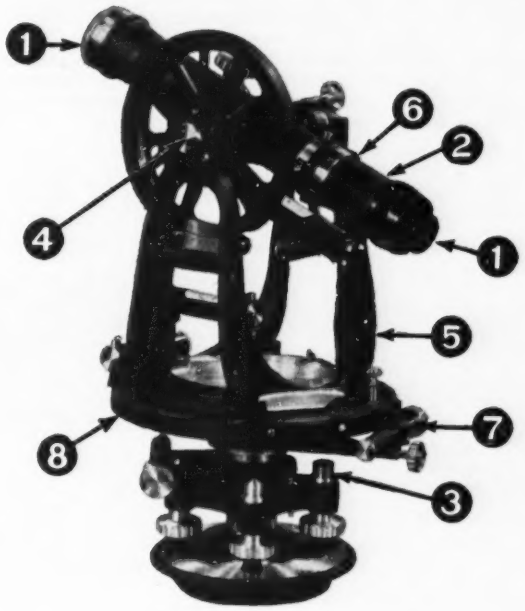

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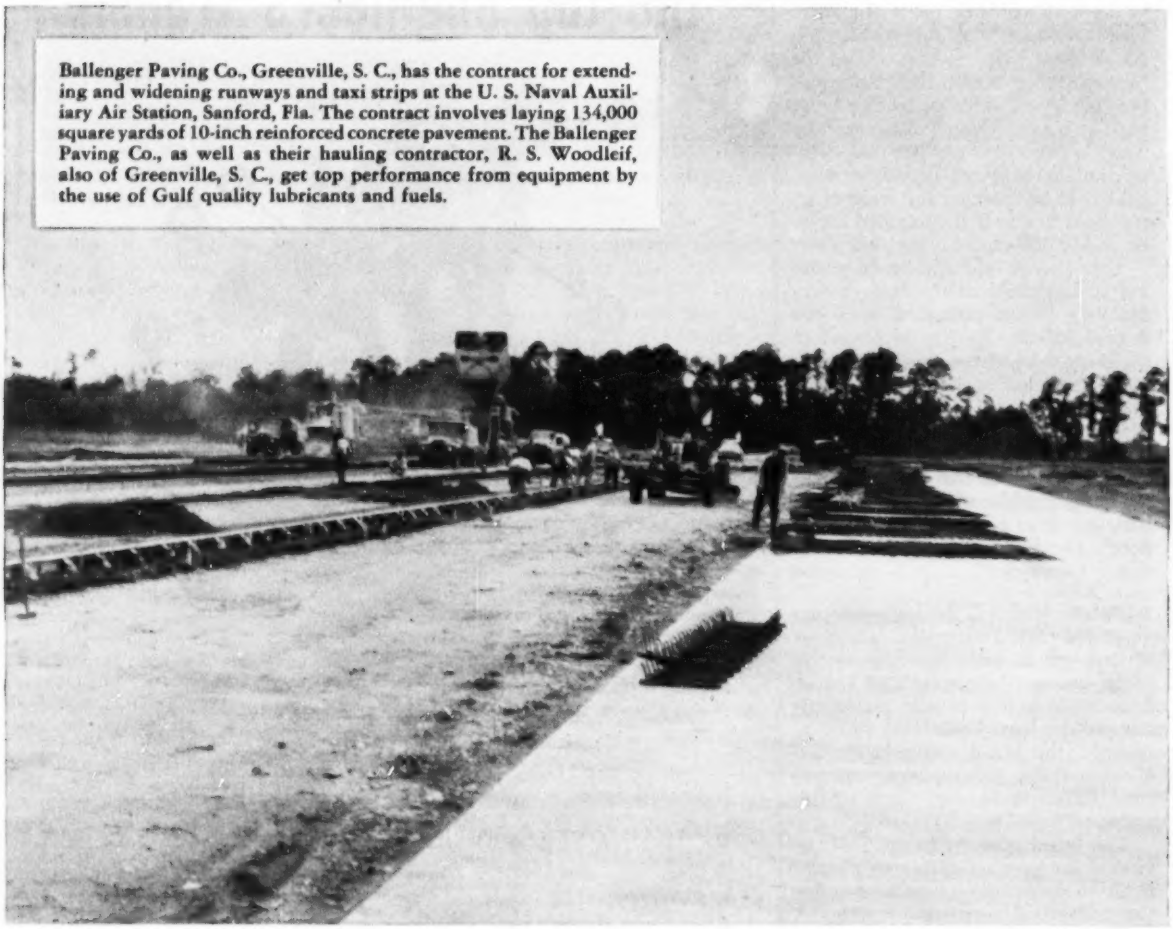

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WEATHER

HOW TO USE the weather tables in conjunction with the 30-day forecasts of the U. S. Weather Bureau:

RAINFALL—When the forecast is for "normal rainfall," precipitation during the period should total somewhere within the limits shown by the table. If the forecast is for "above-normal rainfall," you may expect precipitation to exceed the upper limit.

TEMPERATURE—An "above-normal" forecast indicates the mean temperature for the period should be above the upper limit shown in the table, and below the lower limit if the forecast is for lower temperatures.

How close actual temperatures or rainfall came to July normals is shown in the table at right. By comparing these values with forecasts, you can judge accuracy.

OBSERVED PRECIPITATION AND TEMPERATURE IN 20 CITIES, COMPARED WITH NORMALS

	Precipitation, inches				Temperature, degrees F.			
	July 1953	Departure fr. normal	7 mos. 1953	Departure fr. normal	Mean July '53	Departure fr. normal	Av. daily Maximum	Av. daily Minimum
Atlanta	4.28	−0.03	32.65	+0.82	78.7	−0.8	87.5	69.9
Baltimore	4.54	+0.60	35.44	+9.16	78.7	+0.2	87.3	70.0
Birmingham	4.71	−0.40	33.47	−0.86	79.7	+0.1	89.3	70.1
Boston	2.76	−0.42	35.76	+12.87	73.2	+1.0	82.0	64.4
Chicago	4.16	+1.43	21.01	+1.55	76.4	+1.8	86.5	66.3
Cincinnati	3.42	−0.28	...	...	78.5	+3.4	88.9	68.1
Cleveland	3.08	0.04	20.50	+1.56	74.4	+0.07	86.0	62.7
Dallas	0.38	−1.59	14.96	−7.20	85.1	−0.4	95.0	75.2
Denver	2.98	+1.76	9.21	+0.28	76.0	+1.3	86.4	63.5
Detroit	2.65	−0.26	16.02	−1.23	73.5	+0.4	83.3	63.7
Kansas City	0.96	−1.87	14.25	−6.72	81.2	+0.3	91.6	70.7
Los Angeles	0.00	−T	...	...	74.9	+2.4	85.8	64.0
Minneapolis	6.81	+4.14	21.16	+5.92	72.5	−1.6	82.2	62.8
New Orleans	10.98	+3.89	42.12	+3.06	83.3	+0.2	90.5	76.0
New York	4.12	−0.12	31.16	+6.34	76.0	+1.4	83.7	68.2
Philadelphia	3.38	−0.83	36.56	+11.64	78.8	+1.6	87.3	70.3
Pittsburgh	3.41	−0.31	22.34	−0.38	76.1	+0.7	93.0	55.0
St. Louis	0.72	−2.19	7.38	−5.28	82.8	+2.2	91.9	73.6
San Francisco	T	+0.01	9.54	−3.42	57.3	−1.6	63.9	50.6
Seattle	0.58	+0.06	21.70	+5.19	65.4	−0.2	74.2	56.5

T = less than 0.005 inches

PRECIPITATION RANGE IN 20 CITIES, IN INCHES

Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time, lighter 33.3% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	Aug.	Mid. Aug.-Mid. Sept.	Sept.	Mid. Sept.-Mid. Oct.	October	Mid. Oct.-Mid. Nov.	Nov.	Mid. Nov.-Mid. Dec.	Dec.	Mid. Dec.-Mid. Jan.	Jan.	Mid. Jan.-Mid. Feb.	February	Mid. Feb.-Mid. Mar.
Atlanta	2.79/5.00	2.24/4.30	1.69/3.60	1.64/3.25	1.59/2.90	2.01/3.38	2.43/3.85	2.94/4.58	3.46/5.30	3.42/5.32	3.39/5.33	3.38/5.50	3.36/5.67	3.40/6.00
Baltimore	3.20/5.66	2.65/4.51	2.10/3.36	1.88/3.57	1.66/3.77	1.61/3.45	1.56/3.12	1.99/3.43	2.41/3.73	2.59/3.85	2.77/3.96	2.57/3.68	2.36/3.39	2.48/3.76
Birmingham	2.92/5.25	2.32/4.47	1.71/3.69	1.62/3.14	1.52/2.58	1.84/3.24	2.17/3.91	2.94/4.83	3.71/5.75	3.75/5.58	3.75/5.40	3.61/5.64	3.47/5.88	4.18/6.36
Boston	2.59/4.70	2.32/4.20	2.04/3.70	2.26/3.88	2.49/4.07	2.62/4.26	2.74/4.46	2.82/4.33	2.89/4.20	2.83/4.12	2.77/4.05	2.70/3.99	2.64/3.93	2.79/4.22
Chicago	2.13/3.65	2.11/3.70	2.09/3.75	1.84/3.42	1.59/3.10	1.59/2.95	1.59/2.80	1.46/2.62	1.32/2.45	1.30/2.28	1.29/2.10	1.40/2.16	1.52/2.23	1.76/2.67
Cincinnati	2.24/4.30	2.02/3.64	1.79/3.08	1.64/2.99A	1.49/2.90	1.74/3.28	1.99/3.67	2.14/3.48	2.29/3.28	2.32/3.54	2.34/3.50	2.07/3.40	1.80/3.00	2.10/3.64
Cleveland	1.83/3.60	2.07/3.51	2.30/3.41	2.03/3.29	1.75/3.16	1.79/2.97	1.82/2.77	1.76/2.66	1.70/2.56	1.65/2.58	1.59/2.60	1.55/2.52	1.51/2.43	1.81/2.71
Dallas	1.22/2.78	1.50/2.94	1.77/3.10	1.66/3.30	1.55/3.50	1.60/3.25	1.64/3.00	1.36/3.00	1.09/3.00	1.24/3.05	1.39/3.10	1.49/2.70	1.50/2.30	1.96/3.08
Denver	0.87/1.73	0.60/1.39	0.52/1.05	0.57/1.08	0.62/1.10	0.46/0.89	0.29/0.68	0.34/0.72	0.39/0.77	0.28/0.64	0.18/0.50	0.26/0.54	0.34/0.58	0.46/0.84
Detroit	1.79/3.38	1.80/3.41	1.82/3.44	1.72/3.02	1.63/2.60	1.70/2.66	1.77/2.73	1.70/2.66	1.64/2.60	1.63/2.50	1.62/2.40	1.56/2.45	1.51/2.50	2.14/2.64
Kansas City	2.70/5.00	2.84/5.00	2.99/5.00	2.34/4.54	1.69/4.07	1.48/3.21	1.27/3.25	1.02/1.95	0.77/1.55	0.68/1.48	0.59/1.42	0.80/1.66	0.99/1.90	1.29/2.40
Los Angeles	0.00/T	0.00/0.02	0.00/0.03	0.08/0.32	0.15/0.60	0.20/0.95	0.26/1.30	0.70/2.00	1.14/2.70	1.19/3.00	1.24/3.30	1.12/3.25	0.99/3.20	1.06/3.08
Minneapolis	2.19/3.70	2.24/3.78	2.29/3.85	1.79/3.15	1.29/2.45	0.98/2.01	0.67/1.57	0.62/1.44	0.57/1.30	0.60/1.19	0.64/1.08	0.58/1.08	0.52/1.08	0.75/1.38
New Orleans	4.44/6.75	3.78/6.12	3.11/5.50	2.55/4.81	1.99/4.12	2.34/4.40	2.69/4.67	2.96/4.92	3.24/5.17	3.36/5.28	3.49/5.40	3.14/5.05	2.79/4.70	3.00/5.00
New York	2.72/5.20	2.46/4.30	2.21/3.40	2.15/3.76	2.09/4.13	2.15/4.04	2.21/3.95	2.42/3.86	2.64/3.77	2.55/3.71	2.46/3.65	2.41/3.88	2.36/4.10	2.35/4.08
Philadelphia	2.79/5.45	2.44/4.62	2.09/3.90	2.04/3.85	1.99/3.80	2.18/3.65	2.36/3.50	2.50/3.70	2.64/3.90	2.60/3.80	2.57/3.70	2.57/3.69	2.57/3.68	2.60/3.84
Pittsburgh	2.32/3.80	2.20/3.30	1.87/2.80	1.98/3.00	2.09/3.20	1.96/2.96	1.84/2.92	1.96/3.00	2.09/3.27	2.21/3.20	2.14/3.13	1.96/2.98	1.77/2.83	2.06/3.15
St. Louis	2.14/4.11	2.12/3.84	2.09/3.58	1.89/3.42	1.69/3.25	1.78/3.28	1.86/3.30	1.79/3.05	1.64/2.80	1.52/2.78	1.39/2.70	1.48/2.80	1.57/2.90	1.92/3.42
San Francisco	0.00/T	0.00/0.13	0.00/0.26	0.10/0.73	0.19/3.20	1.12/2.25	1.04/3.30	1.62/4.28	2.19/5.25	2.34/5.12	2.49/5.00	2.24/4.86	1.99/4.71	1.96/4.13
Seattle	0.18/0.90	0.62/1.55	1.07/2.20	1.70/2.85	2.32/3.50	3.07/4.55	3.82/5.60	4.00/5.74	4.17/5.89	4.14/5.57	4.12/5.25	3.34/4.92	2.55/4.60	2.18/4.02

A—Lexington, Ky. T—Traces (Less than 0.005 inches)

MEAN TEMPERATURE RANGE FOR 20 CITIES, IN DEGREES F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	Aug.	Mid. Aug.-Mid. Sept.	Sept.	Mid. Sept.-Mid. Oct.	October	Mid. Oct.-Mid. Nov.	Nov.	Mid. Nov.-Mid. Dec.	Dec.	Mid. Dec.-Mid. Jan.	Jan.	Mid. Jan.-Mid. Feb.	February	Mid. Feb.-Mid. Mar.
Atlanta	78.0/79.1	76.3/78.1	72.9/75.4	68.2/70.2	62.3/63.8	56.6/58.2	76.9/78.5	46.6/48.4	44.0/46.0	43.3/45.3	43.5/45.5	44.0/46.4	45.1/47.9	47.5/50.1
Baltimore	73.6/75.7	71.1/73.3	67.1/69.4	62.2/64.4	56.4/58.3	50.9/52.6	45.6/47.0	40.2/42.0	35.8/37.8	32.2/36.1	33.9/35.7	33.4/36.0	34.6/38.0	38.1/41.7
Birmingham	78.5/79.8	76.6/7.85	73.3/75.6	68.5/70.7	62.2/64.2	56.2/58.5	50.7/53.2	46.5/48.9	44.3/46.5	43.4/46.1	43.5/46.5	44.4/47.6	46.0/49.4	48.8/51.7
Boston	70.9/72.1	67.6/69.2	63.3/65.4	58.9/61.0	54.2/56.2	49.3/51.3	43.6/45.6	36.8/39.2	31.2/34.0	28.9/31.9	27.9/31.2	25.4/29.6	27.8/30.0	31.4/34.0
Chicago	72.0/73.7	68.8/70.7	64.5/66.7	59.3/61.7	52.8/55.3	45.9/48.6	38.6/41.5	31.2/35.0	25.7/30.3	23.7/28.5	23.2/28.1	23.1/28.1	24.7/30.0	29.2/34.2
Cincinnati	72.5/74.4	70.2/72.1	66.5/68.4	61.2/63.3	54.9/57.1	38.6/50.9	42.0/44.5	35.9/39.1	31.4/35.2	30.1/34.4	29.8/34.6	29.9/34.4	31.6/36.0	35.2/39.2
Cleveland	70.9/72.7	68.5/70.6	64.7/67.1	59.5/61.9	53.5/55.6	47.1/49.3	40.5/42.7	34.3/37.2	29.3/32.9	27.3/30.9	26.9/30.5	26.0/29.6	26.2/29.7	29.8/33.7
Dallas	85.1/86.7	82.3/83.9	78.1/79.7	73.8/75.1	68.5/69.4	61.4/63.1	54.3/56.7	43.9/52.3	47.0/49.3	44.8/47.1	44.1/47.5	45.8/49.2	48.8/52.2	51.9/55.6
Denver	70.8/72.2	67.3/68.6	62.2/63.4	56.7/58.3	50.8/52.8	44.5/47.2	38.0/41.4	33.5/36.7	30.5/33.5	28.3/31.4	27.0/30.0	27.9/31.5	30.5/34.7	33.1/36.8
Detroit	70.5/72.0	67.5/69.5	63.0/65.6	57.8/60.2	51.9/54.1	45.8/47.9	39.2/42.1	32.9/35.3	27.9/30.9	25.6/28.5	24.8/27.7	24.2/27.8	24.6/28.9	27.9/32.1
Kansas City	78.4/80.1	74.6/76.6	69.7/71.9	64.4/67.0	58.1/61.2	50.7/53.9	42.6/45.9	36.7/40.1	32.4/35.9	30.4/33.0	30.0/31.9	30.2/33.6	32.2/37.1	37.3/41.2
Los Angeles	67.4/68.6	66.8/68.1	65.9/67.3	64.4/65.9	62.7/64.2	60.5/62.1	57.9/59.8	56.5/58.2	54.9/56.5	53.4/54.8	52.7/54.0	52.6/54.3	52.9/55.1	54.1/56.3
Minneapolis	70.8/72.3	66.3/68.4	61.0/63.6	55.5/58.3	48.8/51.7	40.6/44.5	30.9/36.0	22.5/28.1	16.2/22.3	13.8/18.4	13.4/16.5	13.3/17.7	15.0/20.8	21.7/25.9
New Orleans	81.8/82.7	80.8/81.9	78.5/79.7	75.1/76.5	70.5/71.9	64.6/66.8	59.0/61.9	56.0/58.5	54.6/56.8	53.2/56.0	52.6/56.0	54.0/54.4	55.9/59.3	57.6/60.8
New York	73.6/74.9	70.0/72.5	67.4/69.0	62.7/64.3	57.0/58.6	51.8/53.2	46.5/47.9	40.2/42.3	34.6/37.5	32.5/35.2	32.0/34.6	30.9/33.6	30.9/33.6	34.1/36.8
Philadelphia	73.3/74.5	70.6/72.1	66.8/68.5	61.6/63.5	55.6/57.6	50.3/52.3	45.3/47.2	39.5/42.0	35.1/37.3	32.7/35.4	31.8/35.0	31.1/34.3	32.3/35.3	36.4/39.2
Pittsburgh	69.3/70.9	67.2/68.9	64.0/65.9	58.8/60.9	52.0/54.4	46.2/48.2	40.3/42.0	34.0/36.4	29.5/32.6	27.8/31.0	26.9/30.1	26.4/30.5	26.9/32.0	31.5/35.4
St. Louis	76.7/78.5	73.6/75.6	69.1/71.2	64.0/66.3	58.1/60.5	51.0/53.9	43.6/46.9	37.6/41.2	33.3/37.1	30.9/35.1	30.1/34.7	31.3/35.7	33.7/38.1	37.8/41.8
San Francisco	60.1/61.2	60.9/62.2	61.3/62.8	60.4/62.0	58.5/60.2	56.4/57.9	53.8/55.0	50.9/52.3	48.7/50.2	47.1/48.9	46.9/49.1	48.3/50.8	50.0/51.7	51.9/52.8
Seattle	62.7/64.1	60.8/62.0	58.0/59.0	54.8/56.1	51.0/52.5	46.8/48.3	43.1/44.5	41.0/42.4	39.4/40.7	37.7/39.0	37.2/38.5	38.2/40.0	39.7/42.0	41.7/43.3

Why research never says: "let well enough alone"

Anyone might fairly assume that cast iron pipe which has served, and is still serving, over 45 American cities for more than a century, is as efficient and economical as pressure pipe can possibly be. Our member Companies have not been content to rest on that assumption.

By continuous research and development, they have attained, in *modernized* cast iron pipe, greater toughness, strength and uniformity to a point resulting in still greater efficiency and economy.

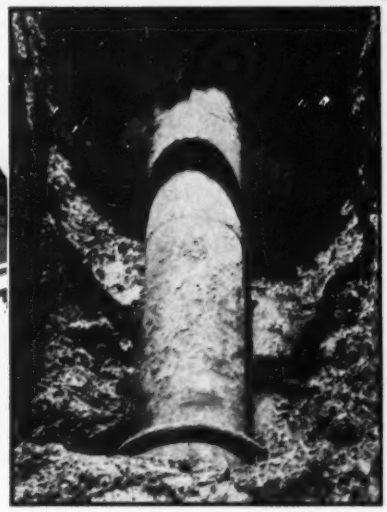
***Modernized* cast iron pipe is centrifugally-cast. Where needed and specified, it is lined with cement mortar centrifugally applied, resulting in a tuberculation-proof pipe with sustained carrying capacity and, therefore, reduced friction loss and pumping costs.**

If you want the most efficient and economical pipe ever made for water distribution, your new mains will be laid with *modernized* cast iron pipe with either mechanical or bell-and-spigot joints. Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3.

CAST Q IRON

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Modernized **cast iron**



This cast iron water main, uncovered for inspection, is in good condition after 100 years of service in Alexandria, Va.—one of more than 45 cities with century-old water or gas mains in service.

pipe *for Modern Waterworks Operation*

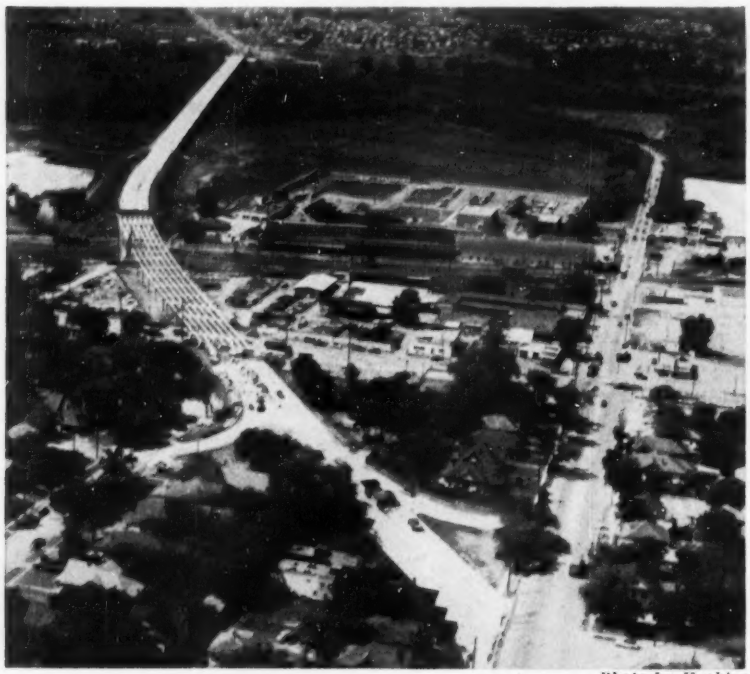


Photo by Haskins

OCTOBER COMPLETION of overpass in foreground will feed traffic from new Forest Avenue viaduct, background, into the south and east sections of Dallas.

Dallas road project 75% complete

Program's consummation will speed county's intertown travel, relieve mid-town traffic tangles and help commuters

Booming Dallas County, Tex., last week was entering the final 25% of contract letting for its $22.5-million bond-financed road and bridge program begun in 1950.

An estimated 65% of the work is complete now, and another 10% is under contract. Figures include nearly all the major projects. The program sets up an interlocked network of city streets and county roads supporting one of the nation's most important highway centers. (Five major U. S. highways—No. 67, 75, 77, 80 and 175—converge on Dallas.)

Consulting engineers O. H. Koch and James D. Fowler, in charge of the program, estimate the last of the money will be spent by the end of 1954.

• **Major projects featured**—Principal items are:

• A 90-mile Belt Line road girdling the county and linking its principal small towns with one another on a 22-ft blacktop that broadens into a 40-ft concrete speedway in and near several of the larger towns.

• Two new reinforced-concrete viaducts spanning the Trinity River and its levees, giving Dallas eight viaducts in all. The city lies on both sides of the levees, and depends entirely on its viaducts for access back and forth.

• Three entirely new arteries connecting Dallas with the suburban cities of Garland, Mesquite and Lancaster.

The new Belt Line, when complete, will give residents of suburban Seagoville, Lancaster, Cedar Hill, Grand Prairie, Irving, Carrollton, Richardson, Garland and Mesquite ready access to one another without fighting downtown Dallas traffic or unpaved cowpaths.

• **Cost increases**—Belt Line existed on paper for years, and much of it still was on paper only when the current program began. Much of the rest was narrow, gravel-topped and unreliable in bad weather.

The improvement program set aside $3.4 million for Belt Line, but so much money has been used to re-route sections of the original road that estimates now run as high as $6 million to pave all of the highway.

• **Money dwindles**—Bond money voted for this and other parts of the program will run short, it is now conceded. Original cost estimates largely were low to begin with. The result is several gaps in Belt Line; other arteries will not be widened and resurfaced at their suburban extremities, as planned. A supplementary bond issue is under consideration.

• **Benefits merchants**—The new $1.4-million Hampton-Inwood viaduct, opened to traffic in July, links two major Dallas streets (also being improved as part of the program), and thereby connects the city's western and northern portions directly for the first time. When work is completed on the feeder roads on either side of the viaduct, congestion in the downtown section is expected to be relieved materially.

• **And commuters**—The $2-million Forest Avenue viaduct and relief bridges, supplanting a rickety wooden bridge built in 1909, will tie the city's eastern and southern sections with a mushrooming residential area south and west of the river. It will be fed from the west by a new artery, Kiest Boulevard, built in two 20-ft concrete traffic lanes. The Forest Avenue span is scheduled to open by early October, when a new railroad overpass at its eastern end is complete. Like Hampton-Inwood, it has a 48-ft roadway, with 3½-ft sidewalks paralleling either side.

Viaduct designers were Mitchell & Hunt, San Antonio; consulting engineers, Koch & Fowler, Dallas; builders, Austin Bridge Co., Dallas.

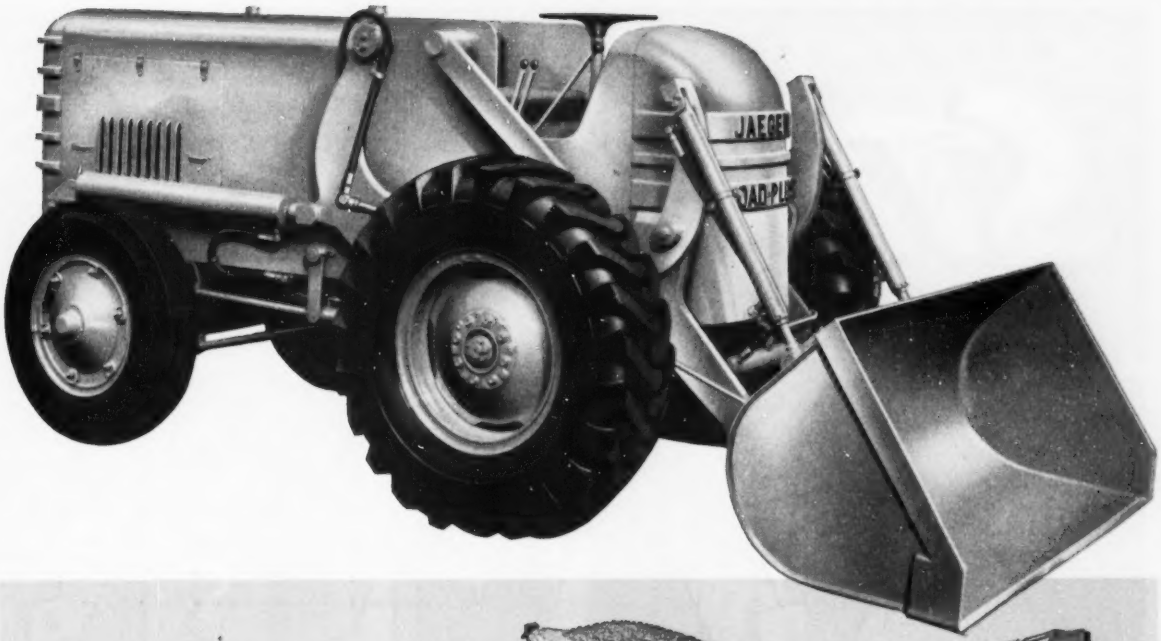
Airport improved through purchase of golf course

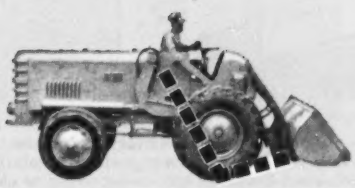
Acquisition by condemnation of a 168-acre golf course in Portland, Ore. has set the stage for a $7-million expansion of the city's International Airport.

Planned improvements include a new runway parallel to the existing 8,800-ft strip, and a new terminal building to be located between the two with entrance from one end.

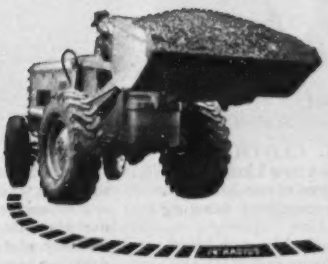
Roads and utility installations are scheduled for completion late in 1954.

(*Municipal continued on page 64*)

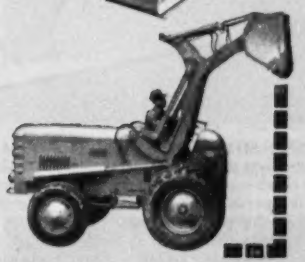




All weight centers on driven front wheels for maximum traction. Torque converter automatically applies power needed to meet the load.



Power-steered rear axle turns unit in 14' radius. 5 speeds to 28.2 mph reverse, 18.7 forward.



Has 24" reach at 8' 2" dumping clearance; booms and bucket under finger-tip control.

Jaeger "load-plus" Designed to the performance specifications of hundreds of America's crack operators, this faster, more stable, more maneuverable loader easily outproduces any other loader in the field.

Now available in 1 cu. yd. size with torque converter, front-wheel drive, rear axle power steering and instant directional shift. Also in 12 cu. ft. car-unloader model. For complete information, send today for Catalog L100-3.

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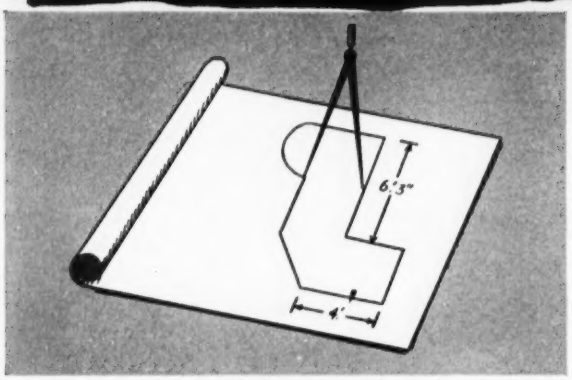
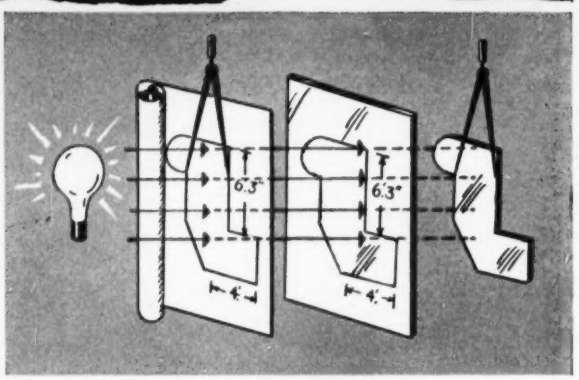
STABILENE



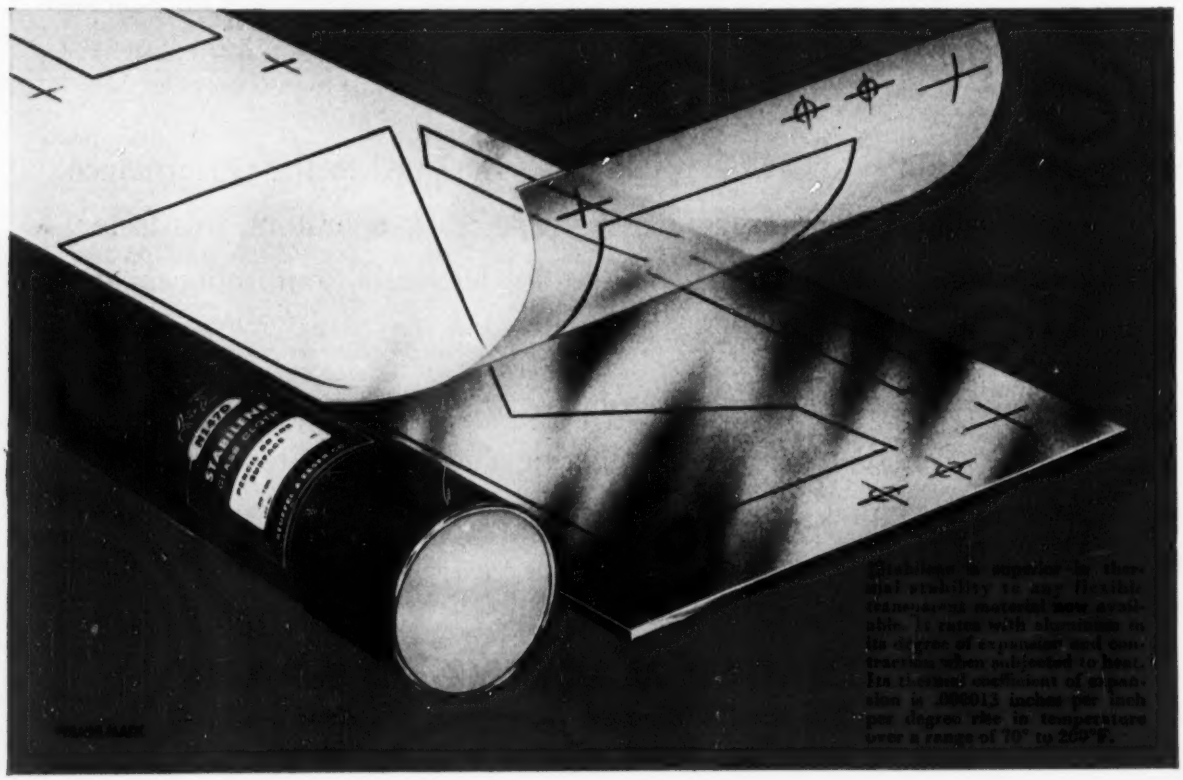


DIMENSIONALLY STABLE; TRACING CLOTH: Stabilene—first nationally introduced by K&E—is a new kind of tracing cloth—a *woven glass* cloth with a high degree of *transparency*. It is specially impregnated to provide an excellent drawing surface for pencil or ink.

Because Stabilene is both dimensionally stable and transparent, you can reproduce from Stabilene right on tool materials.

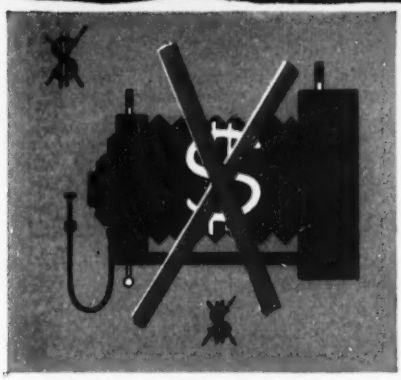
"DRAW IT *ONCE*": Tool designs are drawn *only once*—full scale on Stabilene—then reproduced by contact printing on tool material which has been sensitized with a reproduction solution.

Preliminary dimensional drawings on tracing paper or cloth are eliminated altogether. The original drawings on dimensionally stable Stabilene are the *only* drawings required from drafting room through tool production.



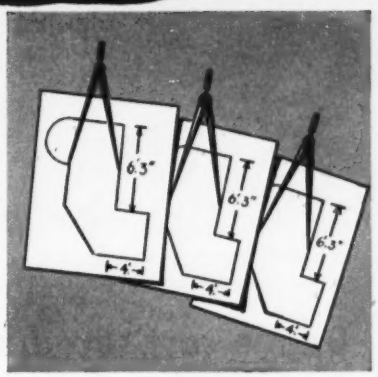
A SHORT CUT TO CUT COSTS!

The Right Angle



REVOLUTIONIZES PRODUCTION AND COSTS: Eliminates the need for shop layouts, camera photography, hand-scribing, and other methods calling for expensive equipment and highly trained personnel.

If a template is damaged or extra templates are needed new ones can be made from the original Stabilene drawing . . . quickly, easily, and inexpensively.



"DUPLICATE ORIGINALS" FROM STABILENE: Stabilene, itself sensitized for reproduction, can be used for dimensionally stable "duplicate originals." Such reproductions made on Stabilene are easily shipped to sub-contractors in lightweight rolls. "Duplicate originals" can also be used as the basis for design changes, new drawings, or composite drawings.

Stabilene has cut costs for the aircraft industry, for instance, by eliminating many laborious steps once essential to the production of jigs, fixtures and dies, and other tools.

Stabilene is used by oil and utility companies, as well as by government departments for mapping and plane table work. Stabilene's dimensional stability is of vital importance in all these functions. For optical comparator work, the dimensional stability of Stabilene Glass Tracing Cloth makes it as accurate as the glass screen itself. Its transparency, too, is an essential feature for this work.

Stabilene has done much for others . . . think about what it might do for you . . . in cutting costs and speeding production.

We will gladly advise you about the application of Stabilene and help you get started. K&E can also make Stabilene reproductions for you. Write Keuffel & Esser Co., Hoboken, N. J. or ask your nearest K&E Branch or Distributor.

Save time, trouble and eyesight with a K&E PARAGON† Drafting Machine. You control your calibrated straight edge with a light touch of one hand, for parallel lines and lines at any angle.

Make your lettering letter-perfect and save wear and tear on your nerves by using a LEROY† lettering outfit. Template grooves guide your pen so the finished result looks like printers' type, and the whole process is relaxing. There's a wide choice of sizes, styles and symbols.

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COMMENT
from the
BUTLER ENGINEER

Coins of Far-flung Lands . . . and 3-D

Butler Plants — Roadbuilders and Ready Mixed, are "One-Worlders." That is to say, they are utterly without prejudice as to the currency in which they earn profits for their owners. To name only a few, Butler-batched concrete is paid for in rupees, cruzerios, bolivares, pesos, marks, francs and pounds . . . Maybe walrus tusks too, for we have several plants operating in the Arctic.

As my mind wanders over the countries represented by those coins, it occurs to me that those Butler Plant owners have paid us an extraordinary compliment. When you consider the length of time it takes for replacement parts to reach many of those global outposts — and consequently the horrendous cost in down-time — it's a reflection of high confidence that Butler was chosen.

Do you ever have to bid against tricky specifications? Electronic control devices? Automatic recording equipment? Automatic, interlocked batching? Just come to Butler if you have those problems . . . We're dealing with them every day — and love them.

And that's not to say we don't love the more conventional designing, too. Any plant of any size from small Roadbuilders' jobs to a mammoth Central Mixing Plant for the Corps of Engineers gives us joy. I guess we just love our work.

The local newspaper here in Waukesha carried the first 3-D advertisement in history. Those little polaroid glasses to view it were stitched on the page. Very effective. Lots of progressive things go on in Waukesha.

Better come up and see us sometime.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

PILES WERE CUT off at design level, reinforcing rods placed with ends extending to anchor caps and concrete poured in to give steel encased concrete bent-posts.

Bridge cost sliced by design switch

Last summer the city of Milwaukee sought bids for a bridge across the Kinnickinnic River. Since the low bid was $321,000—considerably more than the available money—a redesign was made upon which the J. C. Thielacker Co. bid $165,747 and was awarded the contract.

This saving of nearly 50% resulted, according to G. C. Ashton, Milwau-

ENR staff photo

Chicago's big cut

Visitors to the Windy City don't recognize the three-block stretch of Michigan Ave from Randolph to Monroe this summer. An area 1,200 ft long by 160 ft wide has been excavated to a depth of 23 ft below street level for the west half of the Park District's new $8.3-million underground garage which will provide 2,350 parking spaces within walking distance of the Loop. Traffic around the site must continue to use a 6-lane temporary detour until that portion of the two-level, reinforced concrete structure is finished and Michigan Avenue restored to service next January. Second phase of the project will be the completion of the east-half of the garage and restoration of Grant Park above it.

WANT TO TAKE A DARE?

Here's a challenge to any owner of any competitive machine.

Your Caterpillar Dealer will demonstrate any Caterpillar-built machine against any competitive unit . . . and he'll do it on your job.

He'll do it—not with a chip on his shoulder—but to show you that a Caterpillar-built machine will do your job better, with more production in less time and for a longer period without down time that costs you money in time and repairs.

If you own Cat* equipment you know it will do these things. If you're using another make, here's your chance to find out whether or not you're getting your money's worth.

If you've never used Caterpillar equipment on your job our dare gives you a chance to compare the working ability of Cat machines with others.

Take the dare . . . get a demonstration . . . any way you look at it, you'll be the winner.

Call your Caterpillar Dealer and say, "Yes, I'll take your dare." Tell him where and when. He'll do the rest.

Caterpillar Tractor Co., Peoria, Illinois.

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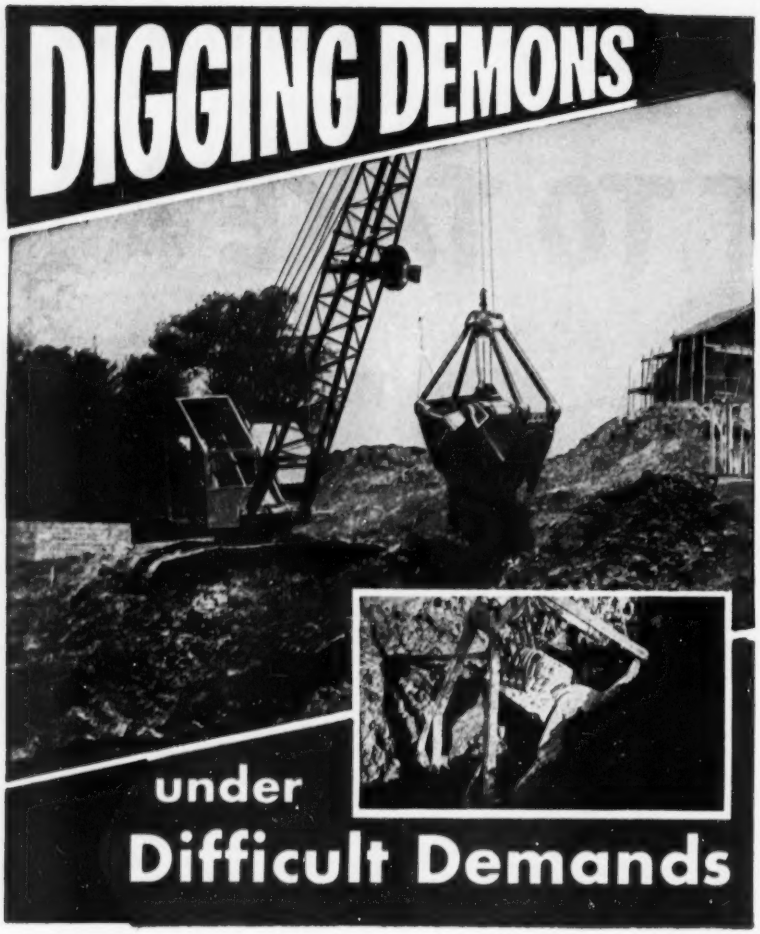
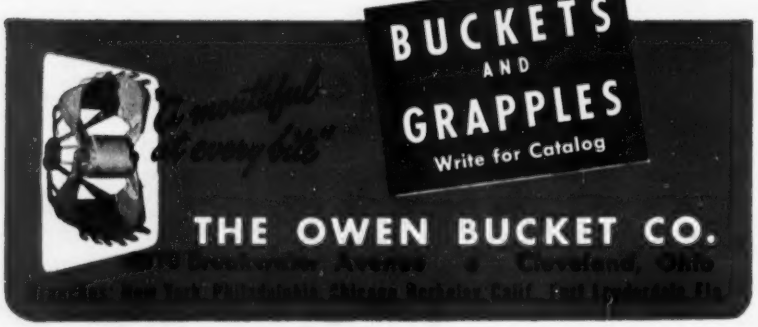
NAME THE DATE... YOUR DEALER WILL DEMONSTRATE



The exceptional "DIG-ABILITY" of Owen Buckets has been acclaimed by crane operators and construction contractors alike since the first Owen was manufactured.

Proof of this is evidenced in the predominance of Owen Buckets seen in operation everywhere on large and small construction projects.

Write for the Owen Catalog and complete information on the line which includes an ideal bucket for every digging, handling or rehandling job.



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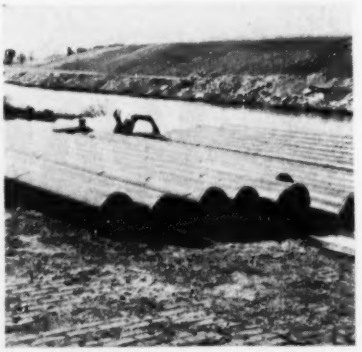

SPIRAL STEEL PIPE piles were delivered with mill-attached conical steel points.

kee superintendent of Bridges and Buildings, from redesigning the structure to use concrete-filled steel pipe pile bents instead of the originally specified concrete piers on timber piles.

The South First Street Bridge, as it is officially known, will be 160 ft long with two 28-ft roadways separated by a 4-ft mall. The deck will be a reinforced-concrete slab with a 3-in. asphalt wearing surface, and will have a 6-ft concrete sidewalk cantilevered out on both sides. It will be supported on continuous steel beams over four spans of 36-44-44-36 ft.

New specifications permitted either octagonal reinforced concrete piles or concrete-filled steel pipe piles. The Gillen Co. of Milwaukee, foundation contractors for the job, chose spiral welded steel pipe piles of 14 in. dia with a wall thickness of 0.188 in. A total of 104 piles 40 ft long were supplied with mill-attached pressed steel conical driving points.

In order to expedite the work, a wood templet was designed by the city's bridge department to facilitate driving a double row of piles for the center pier at a 2:12-batter for thrust resistance. After the piles had been driven and inspected, reinforcing was installed and concrete placed. The rods, projecting above the tops of piles, served as anchorage for the concrete caps.

The structure is scheduled to be opened to traffic late this year. Donald Mog is supervising construction for the city, and Sig Wagner was superintendent for the Gillen Co.

Consultants join forces

Lawrence V. Sheridan and Kenneth L. Schellie, municipal planning consultants of Indianapolis, have announced the formation of a new organization, Metropolitan Planners,

Now... set fastening studs wherever they're needed
MODEL 450 REMINGTON STUD DRIVER
Here's new economy . . . new speed in construction fastening! The Remington Stud Driver joins wood or steel sections to concrete or steel surfaces in seconds . . . easily sets as high as 5 studs a minute. Powerful 32 caliber charges drive studs arrow-straight. The tool's light weight—only 5½ pounds—simplifies handling wherever studs are needed.
New guards for specific uses now make the self-powered Remington Stud Driver more versatile than ever. These attachments take all the guesswork out of stud location . . . assure fast, accurate fastening for every job. Illustrated are just 4 of these special guards. For full information about the complete line and about the Remington Stud Driver, send the coupon below.
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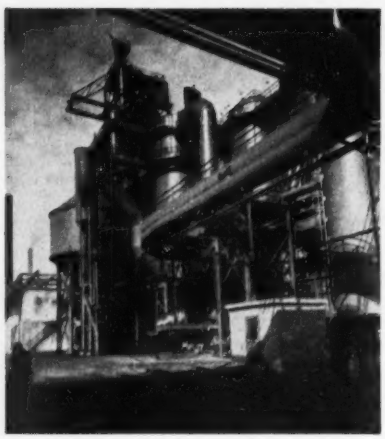
HOW FRANKI FOUNDATION COMPANY Saved over $20,000 for Pittsburgh Coke & Chemical Co.



Blast furnaces, stoves, cast houses, and dust collector of Pittsburgh Coke and Chemical Co. at Neville Island, Pittsburgh, Pa. 274 caissons averaging 14'6". Consulting Engineer and Constructor: Freyn Engineering Co., Chicago.

• Here's a job that was originally designed for 35 ton friction piles, with an estimated length of 40 feet into sand, gravel and some silt. But when Franki proposed a 70 ton minimum load, a test was made to determine net settlement.

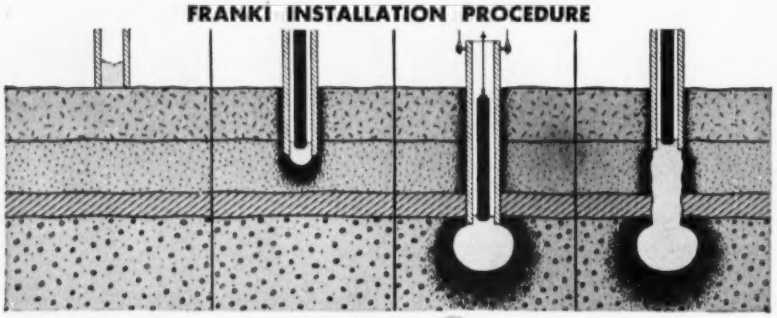
Under the 200 ton load test, a Franki Pressure Injected Spread Footing (a 13-footer), showed a gross settlement of 0.18 inches. On removal of load, net settlement was 0.03 inches. As a result, the design load was raised to 100 tons.

Here's proof again that Franki Pressure Injected Spread Footings are first for safety and economy.

• • • LIGHTEN YOUR COSTS . . . INCREASE YOUR LOAD! • • •

Send for "Franki Facts" for complete information about the Pittsburgh Coke and Chemical Company project—and an illustrated booklet describing the Franki Foundation method in complete detail. Write Franki Foundation Company, 114 East 40th St., New York 16, New York.

FRANKI INSTALLATION PROCEDURE



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Inc. through a merger of their independent firms.

Sheridan, Schellie and Harry C. Sheridan II are officers in the new corporation with Blaine W. Osterling and Robert R. Bell as members of the staff.

The elder Sheridan, prominent among planning consultants, held positions as designer and consultant in the Indianapolis park department, and was executive secretary of the city's plan commission. Having seen commissioned service in World War I, he served as a colonel in the Corps of Engineers during World War II, directing site planning for Army installations.

Schellie, former director of the Indiana Economic Council, has been consultant for many cities during recent years.

End L.A. housing fight, drop half planned units

The Los Angeles City Council, Mayor Norris Poulson, and George A. Beavers, Jr., of the Los Angeles City Housing Authority have signed papers officially ending the city's long controversy over public housing.

The new agreement reduces the original 10,000-unit, $100-million program to 4,357 units by abandoning plans for two of the original ten projects.

Signing of an ordinance and resolution formalizing the curtailment followed word that President Eisenhower had signed the Independent Offices Appropriation bill containing an amendment which authorizes the PHA to write off some $6 million in preliminary design and development costs on the two abandoned sites.

• **Armistice?**—Asked one council veteran of the housing battles, "Do you mean to say that this is the last vote we'll have to take on this public housing issue?"

The compromise plan was proposed by Poulson and worked out by city and CHA officials in consultation with federal authorities.

• **Or armed truce?**—The only apparent source of possible future controversy is disposal of land acquired for the discontinued projects. The sites have an estimated land value of approximately $2 million.

The agreement gives the city an option to purchase them from the CHA "for public purposes", and it has been argued that former landowners could bring suit if their property were used for purposes other than that for which

it was condemned. The city has agreed to defend CHA against any such suits and to pay any damages awarded.

Independence planned by residents of "atom city"

Despite rejection by residents of Oak Ridge of a similar opportunity to govern themselves as an incorporated municipality, Richland, Wash.—another atom city—has moved to be free.

The government-built city of 25,000 at the Hanford plutonium project is stirred over the prospect of the fight to buy homes and business properties.

Principal advocate for the change has been David F. Shaw, the AEC works manager for Hanford who has carried the brunt of the administration load in addition to his project duties. Shaw feels that the government should be out of the municipality business where possible.

Obstacles to the move include the need for a vote by the people, 62% of whom are currently in favor of buying property, and the anticipated burden of taxes due to the absence of supporting industry and other sources of revenue lacking in this type of community.

The Washington State legislature has paved the way for the action by passing an enabling bill to make it possible for Richland to incorporate as a first-class city.

Shaw, predicting that the city would be independent within two or three years, admitted disappointment over delays, and stated that there was "no reason why the American taxpayer should not get back what he spent on the community."

Billion dollar budget asked for N. Y. transit

The New York City Transit Authority approved a billion-dollar improvement program July 23, with $155 million slated for 1954 expenditure. The six-year plan, subject to approval by the Board of Estimate and the City Planning Commission, would provide for construction of a Second Ave. subway line, rehabilitation of existing facilities, extensions to the system and new rolling stock, equipment and power plants.

The first-year funds would come from an unused $70 million in the 1953 capital budget for transit improvement, plus an added new appropriation of $85 million set up in the new plan.

Hugh J. Casey, chairman of the transit authority, said $76 million of

JACKSON VIBRATORY PAVING TUBES

Now SUPER-POWERED MORE FLEXIBLE

FOR THOROUGH INTERNAL VIBRATION OF ALL SLABS 6" TO 24" THICK, UP TO 25' WIDE!

Available with 1 to 5 powerful motors, and vibratory frequency variable to suit mix, no HIGHWAY OR AIRPORT PAVING job is too tough for this machine. Attaches to standard spreader or finisher. Its use assures:

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Briefs from the YEOMANS GUARD

A Competent Man on PUMPS—the Yeomans REPRESENTATIVE

When you are in the market for a pump, you want and welcome the counsel of a man who not merely knows pumps but who is trained to *understand the problem you expect the pump to solve.*

You'll find your local Yeomans representative just the man you're looking for. He operates, or is a member of, his own business. He handles several excellent lines of equipment in the same market category as Yeomans Pumps. As a rule, he has an engineering degree—in some instances he's a capable "engineer by osmosis." In any case, he's a good business man, fully qualified to analyze a problem and to recommend a practical solution.

You'll find him listed in the Classified Directory under "Pumps"—a good man to know.

What Kind of Condensate Pump do you need? . . . YEOMANS HAS IT

Two main facts need to be kept in mind, in selecting a heating pump that will do a good job, last as long as possible and cost as little as possible.

1. There are two main classifications of condensate pumps: floor-mounted—for handling returns that come in above floor level; and submerged—for use where all or part of the returns come below floor-level.

In simplest form the condensate pump handles gravity returns from a few radiators in a low-pressure steam-heating system. This duty is intermittent and easily handled: the pump going on and off frequently during severe cold weather, cutting off altogether in warm weather, and operating intermittently at other times. A light-duty, low-priced pump is indicated for such service.

Heavy Duty Installations

All other types of service call for heavy-duty pumps built to operate on a relatively rapid cycle throughout the year. The pump must have been designed with a sufficient safety factor so that continuous operation is possible.

2. Yeomans manufactures a full line of condensate pumps—six different types for floor-mounting and below-floor installations; for capacities ranging from 10,000 up to 100,000 sq. ft. and over, and pressures of 20 to 100 lbs.

On all problems involving special bearing construction to meet unusual operating conditions, Yeomans engineers always ask permission to make special recommendations.

Application diagrams and other information available on request.

☐ Please send light-duty condensate pump data.

☐ Please send heavy-duty condensate pump data.

What the "TRANSPORTER" does to Handling Costs Makes Very PLEASANT READING

Just imagine a pneumatic device—no moving parts, never requires cleaning or maintenance, completely automatic, absolutely safe—that will handle

• foundry sand • paper pulp • packing house wastes • ashes • powdered coal • tannery wastes • cannery wastes • food materials • sugar, bagasse • sludge • screenings and many others

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What that installation did to costs makes highly entertaining reading.

What's *your* problem? Your local Yeomans representative can give you full information on the "TRANSPORTER"—a Yeomans product. He's listed in the Classified pages under "Pumps". It costs nothing to ask him, may easily lead to big savings. Or write us for bulletin.

☐ Please send TRANSPORTER Bulletin.

The Yeomans Guard, published several times a year, is a compendium of news and useful information covering the pumping of materials and the treatment of wastes, both domestic and industrial. We shall be pleased to send you the current issue if you'd care to have it. Ask your local Yeomans Representative—listed in the telephone book yellow pages under "Pumps"—or write direct.

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the proposed budget is "urgent and vitally needed," and authority engineers gave high priority to the remainder of the total.

Sidney H. Bingham, general manager of the transit authority, said that need for a greater deferred maintenance allocation is a major reason for the recent increase in fares from 10 to 15 cents. The system has been creaking along on an inadequate $3-million-per-year deferred maintenance allocation, and the account is depleted.

Since the authority is now behind in deferred maintenance, Bingham asserted that $15 million should be allocated each year for at least a five-year period, and that the amount should come largely from operating revenue, not from the capital budget.

Construction to start on Toledo's contested airport

Authority for the commencement of grading and drainage operations on two asphalt-surfaced runways for Toledo's Oak Openings Airport has been given by City Manager Arnold V. Finch. The proceed order also included the paving of the larger 5,200-ft instrument runway.

The paving award for the 4,300-ft non-instrument runway will await the opening of bids for the construction of terminal and services buildings.

• **Site-purchase opposed**—Purchase of the site for the $3.5-million airport was hotly contested during meetings of the council in March of this year, but with acquisition of the land, plans have progressed toward the originally estimated late-1954 opening. Included are construction of a $60,000 sewage disposal plant, fences and county-constructed access roads.

Finch said that the failure of cement concrete to compete favorably with the asphalt alternates was due to the stockpiling of cement for turnpike construction. One bidder could obtain a firm commitment of only 9,000 bbl portland cement against a total requirement of 125,000 bbl for entire project.

Municipal briefs . . .

• **The Massachusetts Highway Department** has found a summer use for its winter snow fences. More than two miles of them have been loaned to communities for the enclosure of Little League baseball fields.

• **The Baltimore** Bureau of Water Supply has withdrawn the due date for bids on the $12.5-million Ashburton Filtration Plant.

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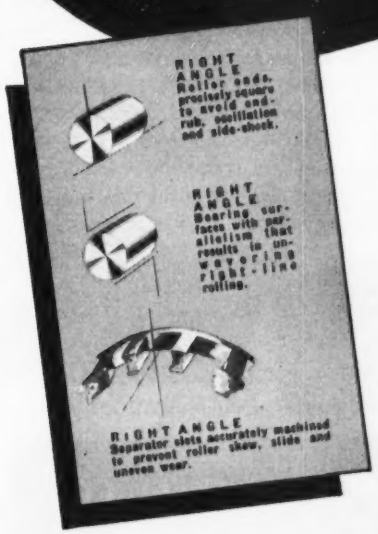
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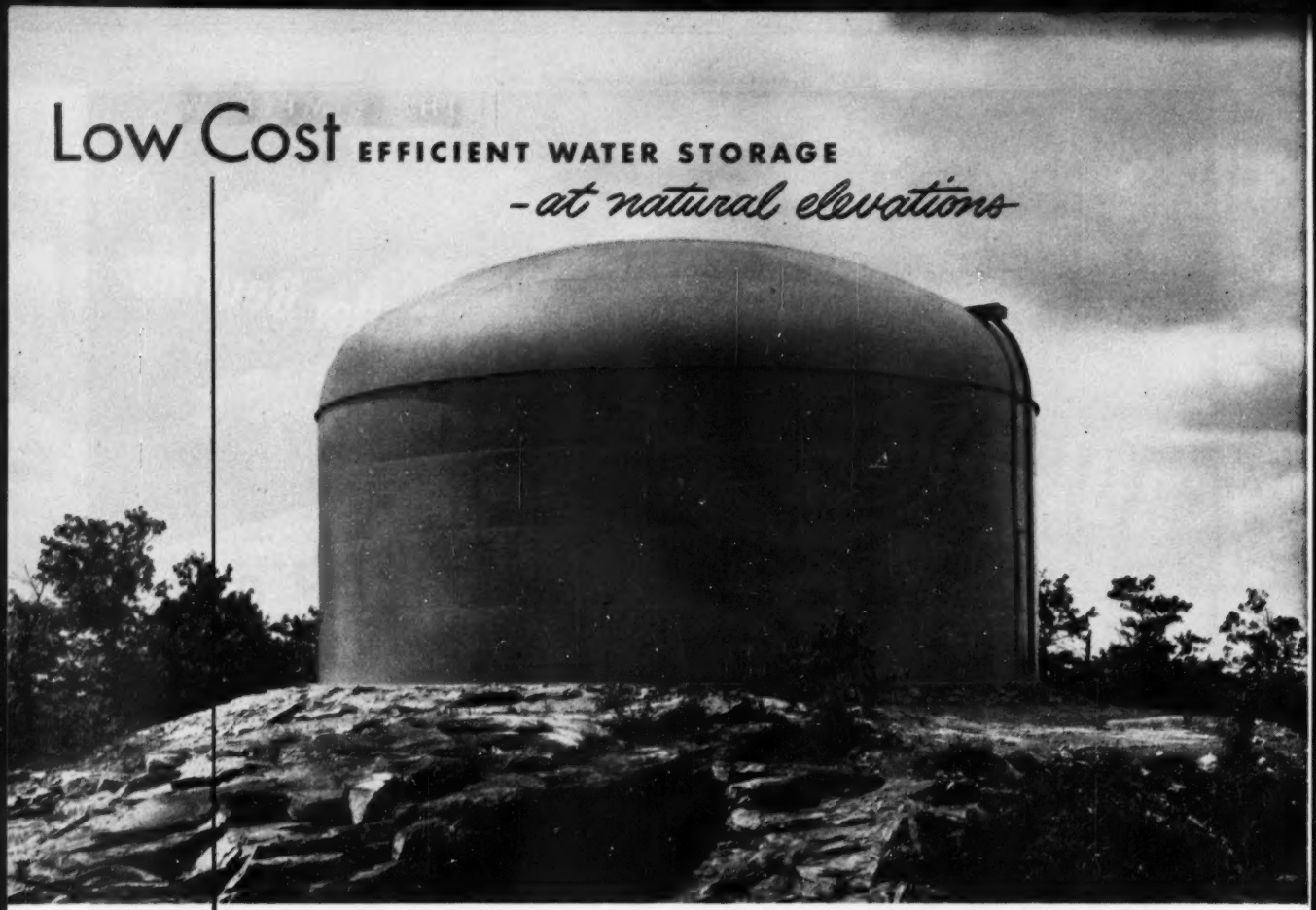
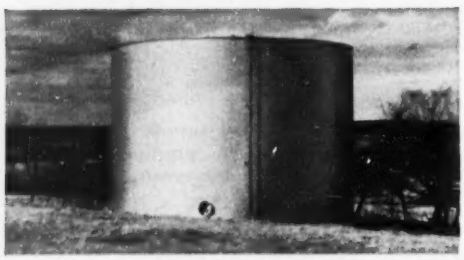
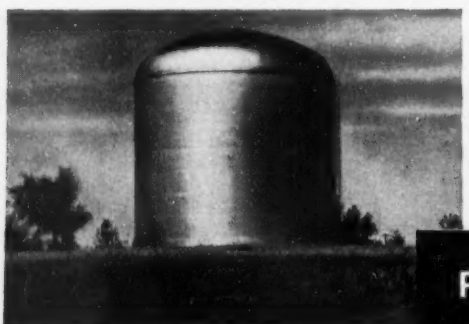


Worcester, Mass.—Ellipsoidal roof type, 1,500,000 gallons capacity.

* *Steel Reservoirs*



Liberty, N.Y.—Flat roof type, 300,000 gallons capacity.



St. Paul, Minn.—Ellipsoidal roof type, 2,000,000 gallons capacity.

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INTERNATIONAL

Latin America expresses anxiety over possible new loan restrictions

Top government officials in every Latin American capital that Milton Eisenhower visited on his recend goodwill tour questioned him anxiously about the new policy of the Export-Import Bank. The anxiety was due to controversy boiling in Washington around the U. S. Government's least controversial and most profitable institution—the Ex-Im Bank.

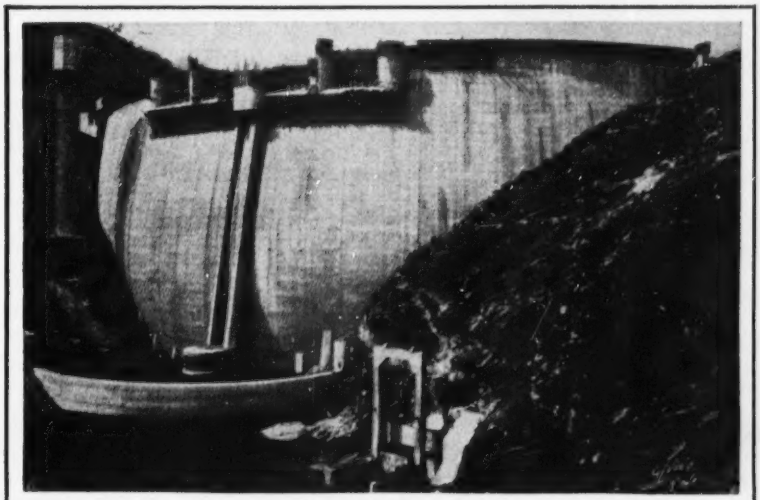
• **A hobble and a shakeup**—The controversy stems from two sources: one from tentative U. S. Treasury plans to cut back Ex-Im's lending authority—particularly for development and reconstruction loans like the recent $300-million balance-of-payments loan to Brazil; the other, from the new Administration's reorganization of the bank.

The reorganization clearly puts Ex-Im much more directly under the thumb of the Treasury Department so that the bank's lending authority can be trimmed that much more easily.

Some Administration officials defended retrenchment of the Ex-Im Bank on the ground that its loans compete with private American investment abroad, and they suggested that the World Bank of the United Nations should be the primary source of public development capital. Latin American officials immediately argued that the World Bank could not fill Ex-Im's shoes in the development field: World Bank's lending is limited by shortage of funds and in it can lend only with government guarantees.

• **A good record**—The whole thing sounded vague and confusing to Latin America. There have been no complaints from U. S. congressmen that Ex-Im was spending too much money. Criticism of the bank in the past has been all to the effect that its lending policies were too restrictive. Several official and private reports recently have recommended permitting the bank to make equity loans abroad, loans not tied to U. S. purchases, to extend the time period of loans, and to accept repayment in kind or in foreign currencies.

The reasons for making Ex-Im loans easier for foreign countries to get are clear. Ex-Im officials estimate that for every dollar the bank has invested in private foreign ventures, $1.50 of private money has been invested which would not have been done had



SALAMONDE DAM, in north Portugal, is one of four dams in hydroelectric development of Cavado River. The bellied, gravity arch structure is 245 ft high. Water from its reservoir will drive a subterranean plant with a 20,000 kw capacity.

Portugal in the last six years has spent $90 million (40% of all expenses for economic development) in the improvement and construction of hydroelectric facilities. Aside from a number of dams under construction at the moment, this small country has 21 other hydroelectric construction proposals under study.

THE SIMPLE WAY TO SHORE LOADS UP TO 9,900 LBS.

Put Up Safway Shoring in 2 EASY STEPS

STEP 1
Extend upper member of Safway shoring close to approximate height. Fasten with pin.
STEP 2
Rotate sleeve nut to elevate head to exact height.

• **It's microadjustable to exact height.** Sleeve turns ¼" per turn. Each thread is tested to 40,000 lbs. Threads are protected against rust and damage.

• **It has up to 9,900 lb. capacity** for 7-foot length . . . a safety factor of 3 to 1. In most cases you need no bracing up to 12 feet and then at greater heights you can use standard Safway tubular steel pivoted cross braces, or lumber.

• **Just 3 shore sizes** cover a complete range from 6 to 15½ feet. Each size has a 5-foot adjustment range. Collar centers upper tube and maintains the load directly overhead. There are three types of heads available for a variety of service conditions.

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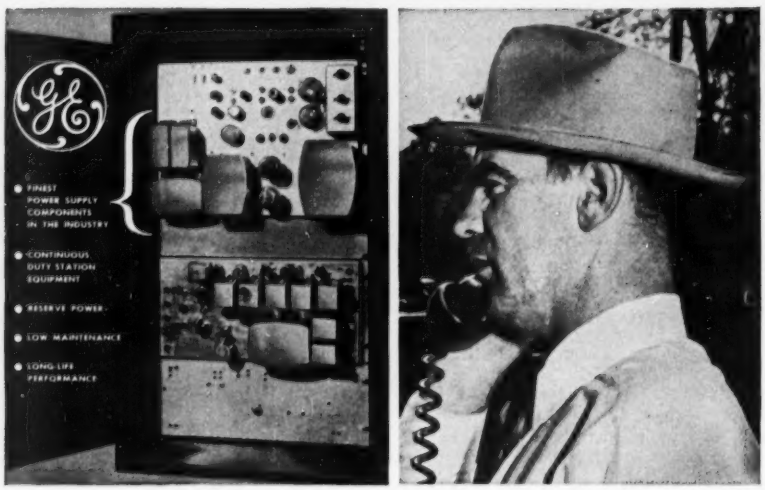

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Replace with G-E and get radio equipment designed for your industry! General Electric, who pioneered in split-channel development, offers low or high band units with *power to spare* for long-life performance . . . maintenance economy. These outstanding 2-way radio features explain why *the trend is to G-E communications equipment.*

Follow the trend . . . replace with G-E!

The CAS* man at a local General Electric office will quickly furnish you with details on this outstanding communications equipment. Why not phone him now or . . .

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GENERAL ELECTRIC

the bank not participated. Latin American officials pointed out that the bank consistently has netted profit for the U. S. Treasury.

Taking Ex-Im's overall private and public investments, an extra $0.50 of private money has been invested for every Ex-Im dollar. Ex-Im's profits speak for themselves. It has accumulated a profit backlog of over $300 million in the last three years and paid an additional $60 million to the Treasury in dividends. These in fiscal 1953 alone were about $45 million.

The bank's record in stimulating private foreign investment is impressive. Belgium, for instance, asked the bank for $50 million last year to finance imports from the U.S. The Belgians had been unable to get private financing, and the bank authorized the loan. But as soon as word got out that Ex-Im was in on the deal, private U.S. banks came right out with loans to Belgium aggregating $43 million of the total. Another example: Ex-Im financed the development of the Itabira iron deposit in Brazil which is now supplying a million tons of ore a year to Bethlehem and U.S. Steel.

It's still too early of course, to say for sure just where Administration policy towards the bank will settle down. The future of Ex-Im's operations probably won't become clear until after the Joint Congressional Executive Foreign Economic Policy Committee makes its report next year.

• **A big operator**—At the moment, Ex-Im's outstanding loans break down this way: $485 million to private concerns; $575 million for foreign government development projects; $962 million for balance of payment loans, commodity loans, and open lines of credit. In the immediate postwar period Ex-Im financed $1.8 billion worth of reconstruction all over liberated Europe. Biggest loan in the bank's history was the $650 million to France in 1946 for reconstruction. After the Marshall plan started, Latin America became Ex-Im's best customer although it also made many loans to the Middle East and Africa.

Statistics tell a lot of the story. Loan authorizations since the inception of the bank in 1934 totaled $6.3 billion as of last month. Of this Europe got a total of $2.7 billion, Latin America $2.1 billion, and Asia $1 billion. Outstanding loans added up to $2.5 billion and undisbursed authorizations $713 million. Total lending authority of the bank is set at $4.5 billion of which a little over a billion is uncommitted.

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Philadelphia Dresser-Couples 2-mile steel main in expanding program of general waterworks improvement.

In adding to many miles of Dresser-Coupled steel mains laid since the War, Philadelphia engineers again recognized the outstanding advantages of this type of construction. These twin steel lines meet the needs of central and southern Philadelphia.

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Actual installation is fast and relatively simple. Lighter weight steel pipe is easier to handle. Long pipe lengths mean fewer joints. Small crews, with a minimum of skill, supervision and heavy equipment, make joints faster, surer. The result—lower cost, maintenance-free lines.

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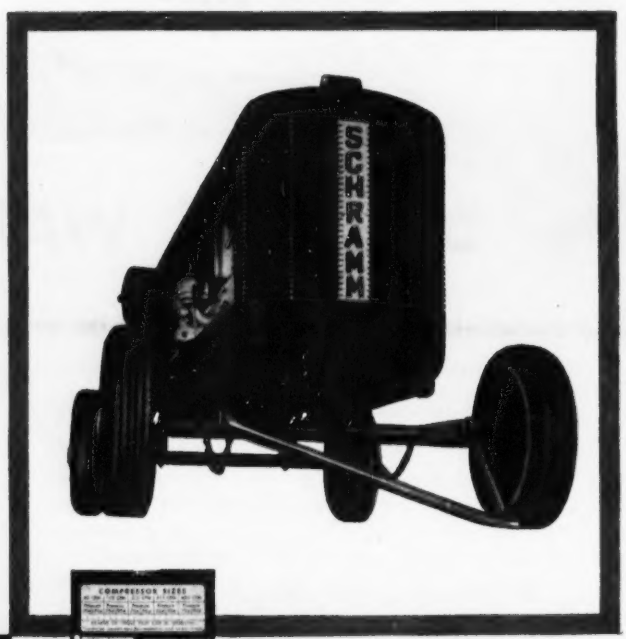

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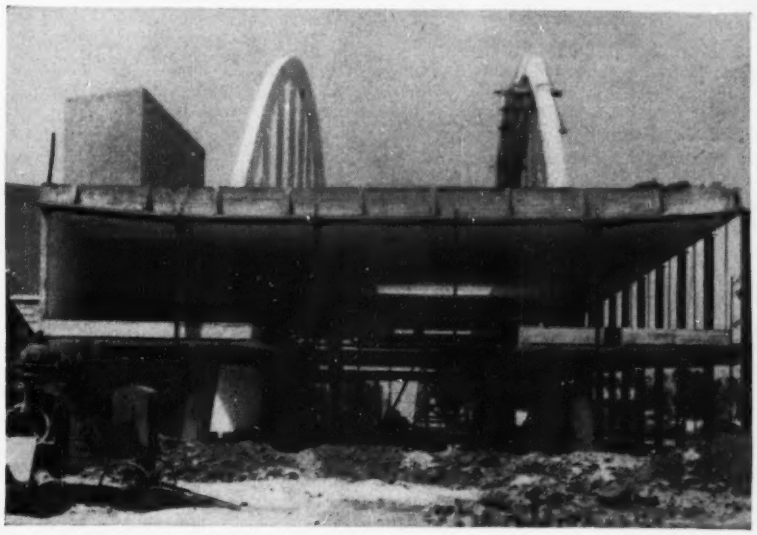
CONCRETE ARCHES support two story shopping center in Mexico City. Roof and second floor hang from steel bars depending from arch.



CONCRETE CEILINGS cantilever outwards from arch-line to permit an open glass wall construction on three sides of the building.

Building hangs from concrete arches to permit maximum glass wall area

Suspended from two reinforced concrete arches, a two-story building of shops is the latest addition to a new Mexico City community center. The roof and second floor of the concrete, steel and glass structure are suspended from the two arches with one-inch steel bars.

At the first floor level the arches have a span of 139 ft. They are spaced 30 ft apart and their height at the center is 50 ft. The steel bars, from which the building depends, hang in groups of four spaced every 10 ft (horizontal distance) along the concrete arch.

The arch construction was chosen by the architect because subsoil three feet below the surface consists of a 20-ft layer of sound volcanic rock. By using the arches he was able to minimize foundation costs for the relatively heavy structure.

The new building's roof and second

9,000

Koppers Pressure-Creosoted Piles Support 31 Six-Story Apartment Buildings

"Beach-Haven at Brighton," located in Brooklyn, N. Y., is one of the huge housing projects of the Fred C. Trump Construction Company of Brooklyn. It consists of 31 six-story housing units, providing 1,860 individual apartments of 2, 3½ and 4½ rooms. The Trump Construction Company writes, "We have driven close to 10,000 creosoted piles on our Beach-Haven project . . . length 30 to 50 feet, with an average of 38 feet depth driven, at a cost of approximately $700,000. We are pleased to advise however that a very substantial saving was effected by using Koppers creosoted wood piles over any other form of pile."

Engineers will tell you that Koppers Pressure-Creosoted Foundation Piles are being used on more and more of the industrial and commercial "big jobs." They insure lasting protection against termites, fungi, and acids in the soil. They are readily available at Koppers wood treating plants, and actually cost less than other permanent pile material.

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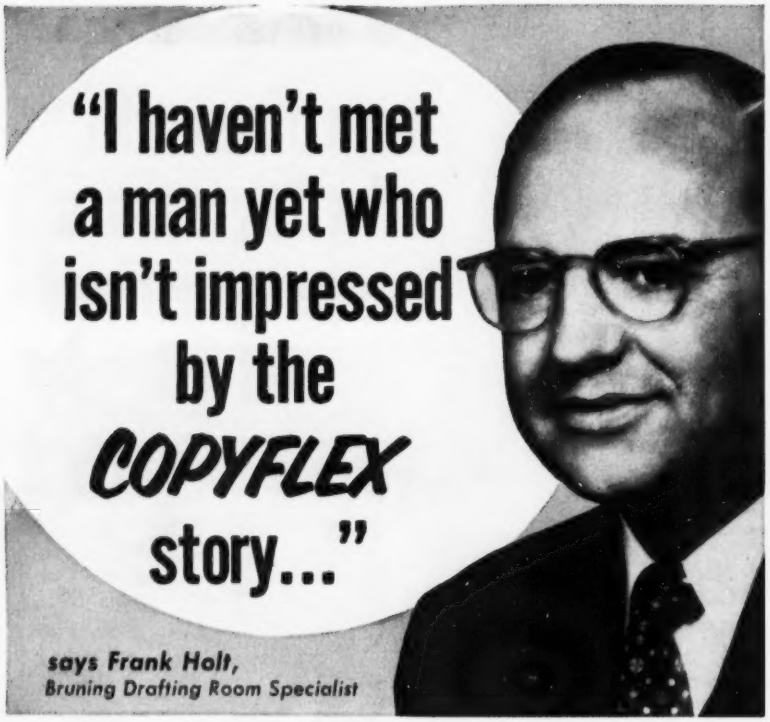

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floor arc of reinforced concrete slabs poured monolithically with formed beams and joists. The arch construction allows a clean, steel-framed glass wall on three sides of the shopping area, as the edges of the roof and second floor cantilever out from the arches and the suspension bars.

The roof is built heavily enough to permit construction of a roof garden and cocktail lounge on it in the future.

Architect for the building is Alejandro Prieto of Mexico City.

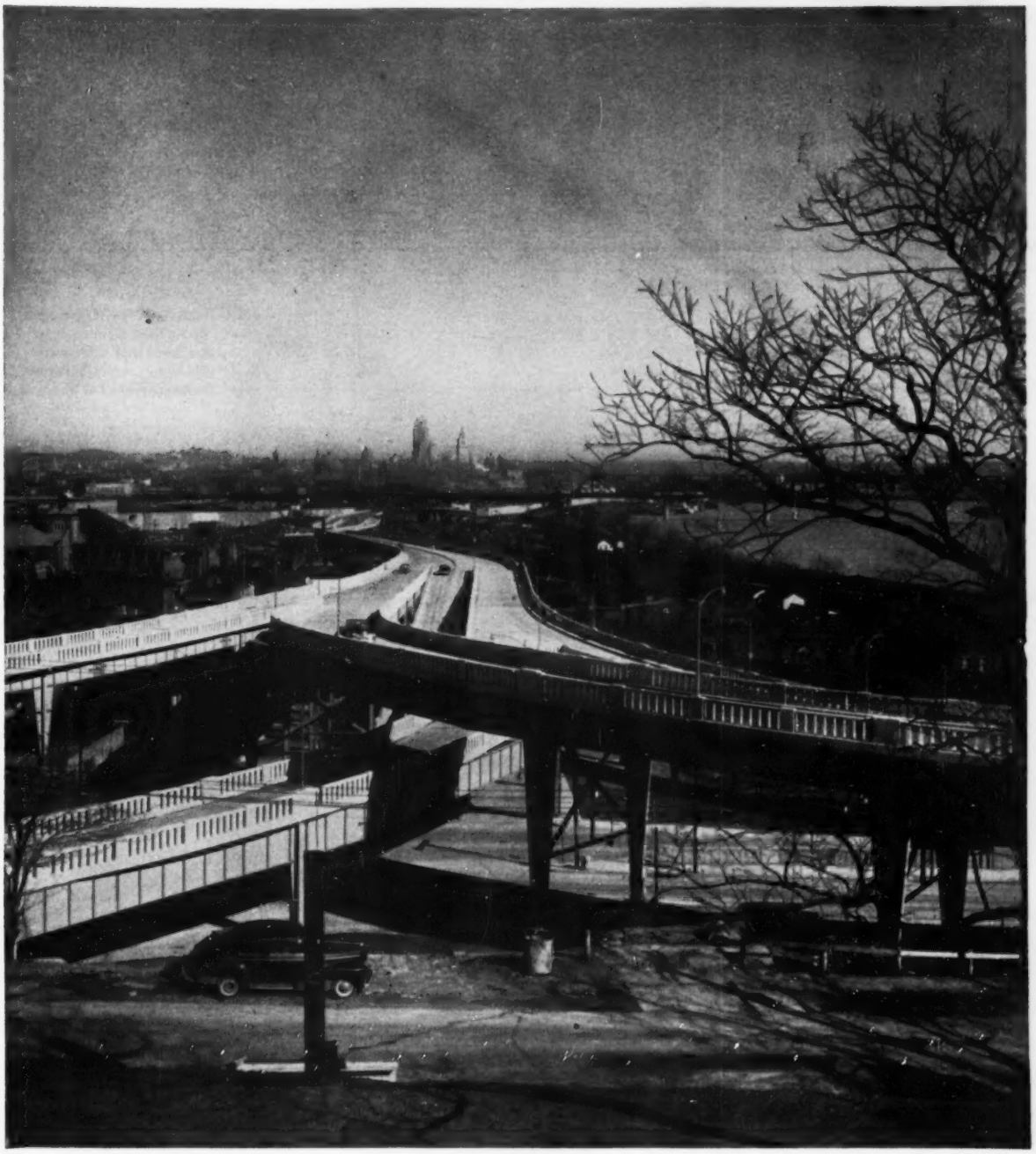
Novel structure designed for climate, earthquakes

Construction has started on the unusual 10-story, $7.5-million headquarters building of the Creole Petroleum Corp. in Caracas, Venezuela. The design of the structure was affected to an appreciable extent by the geographical conditions of Caracas. Most unusual of the building's feature is the seven-car elevator core on the outside of the building. This arrangement was necessitated by the special earthquake bracing in the building plans which would not conveniently allow shafts in the building proper.

To avoid the expense of year-round air conditioning (Caracas is 700 miles north of the equator) the building is laid out on a plan which will permit very little direct sunlight on window areas. On an east-west axis, the structure will have windows only on its north and south sides, while the east and west ends will be effectively sealed against the sun. To control the sunlight that will strike the north and south sides, especially the vertical rays at mid-day, overhanging visors will project from the top of each level of windows.

The walls of the building will be

NEW 16-STORY OFFICE BUILDING under construction in Caracas, Venezuela, will be sheathed in aluminum and made earthquake-proof.

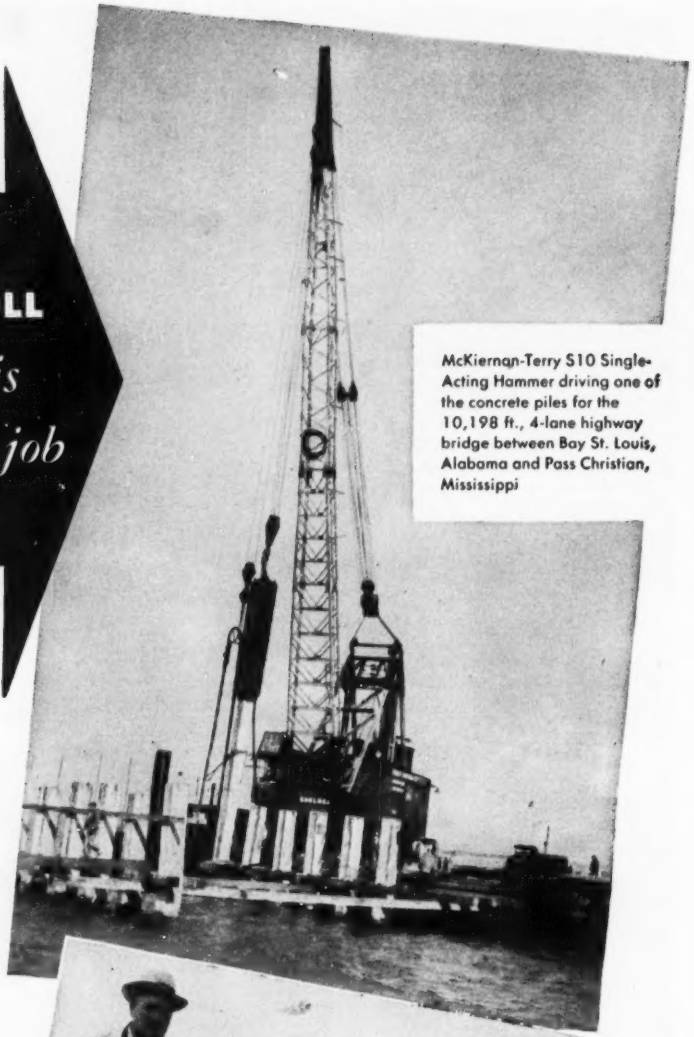


CINCINNATI'S SIXTH STREET VIADUCT—This elevated highway is the western approach to the Sixth Street Bridge over Mill Creek, in Cincinnati. Called the Sixth Street Viaduct, it was built recently to provide a high-speed route to the Western Hills section of the city, as well as to protect bridge traffic from the rising waters of the Ohio River. The viaduct is 3417 ft long, and at its highest point is approximately 50 ft above the ground level. Construction of this huge steel-and-concrete viaduct called for the use of 4750 tons of Bethlehem Structural Shapes.

Owner and Designer: City of Cincinnati, S. A. McGavren, design engineer, T. J. Montgomery, project engineer; *Steel Fabricator and Erector:* R. C. Mahon Co., Detroit.

BETHLEHEM STEEL

A WHOLE "BAG-FULL OF TRICKS" *on this bridge construction job*



McKiernan-Terry S10 Single-Acting Hammer driving one of the concrete piles for the 10,198 ft., 4-lane highway bridge between Bay St. Louis, Alabama and Pass Christian, Mississippi

Here's a job on which real ingenuity was shown at every step.

For greatest economy, the contractor, Merritt-Chapman & Scott, cast the half-deck-width 122-ton roadway slabs on shore; and Roderick Hand, the project manager, rigged up a special home-made gantry to handle the slabs.

When the boiler failed to supply enough steam for the gantry hoists, "Rod" ran the hoists with combined steam and air pressure. He carefully spaced the pile-casting forms so that previously cast piles would serve as side forms for intermediate piles.

Of course, when it came to driving the piles, a McKiernan-Terry Hammer was used. More than 2000 concrete piles, 24x24-in. in size and 90 ft. long, and also 240 H-beam piles from 120 to 190 ft. long were required, so a McKiernan-Terry S10 Single-Acting Hammer was selected to assure speedy work on this heavy-duty job.

Write for the McKiernan-Terry Catalog showing both double-acting and single-acting hammers at work on many other outstanding jobs.

OTHER McKIERNAN-TERRY PRODUCTS

MEAD-MORRISON COAL AND ORE UNLOADERS AND BRIDGES
Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.

GRAB BUCKETS
Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

HONING UP TO 42-IN. I.D. X 55-FT. LONG
Typical of the extensive facilities of McKiernan-Terry for unusual jobs.

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 38, N. Y.

Plants: Harrison, N. J. and Dover, N. J.

sheathed in aluminum and backed with cellular steel panels. Floor framing will be steel "Q" panels.

Lathrop Douglass, of New York, is the architect, and the George F. Driscoll Co. of New York also, is the general contractor.

International briefs . . .

• **Mexican power project**—Mexico has allotted $200,000 for an initial study of the Grijalva hydroelectric and irrigation project which is planned for the tropical State of Tabasco. The $125-million program has three main features: A series of dams to produce electrical energy and irrigation for more than one million acres of land; a network of transport canals; four highways to link the area with the Pan-American highway, Transisthmian highway and roads of the Yucatan peninsula.

• **Canadian gas for U. S.**—State Department officials have agreed to discuss with Canada the possibility of routing a proposed trans-Canadian pipeline through northern Wisconsin and the upper Michigan peninsula. As originally planned, the pipeline would link Alberta's natural gas fields with industrial centers of eastern Canada. The two states involved would benefit by use of the gas.

• **Rainmakers for Israel**—In an effort to increase normal winter rainfall over its parched Negev desert, Israel has hired the American Institute of Aerological Research in Denver for cloud seeding operations. Under the $78,000 contract, the U. S. firm also will train Israeli technicians in order that they may eventually take over the rainmaking job.

• **Pipeline in Chile**—A Belgian firm—Mercantile Marine Engineering and Graving Docks Co. of Antwerp—has been awarded a $4-million contract to supply the entire water piping system for Antofagasta in northern Chile. In addition to delivering about 125 miles of pipe plus necessary valves, the company will supply technicians to supervise the actual pipe laying.

• **New Venezuela hotels**—Construction of five new hotels is being planned by Venezuela under its program to promote tourist trade. Foremost in the series is a $4.2-million luxury hotel planned for a coastal site below Caracas; others will be erected at Porlamar (on the Isle of Margarita) and in the state capitals of Barinas, Coro and Trujillo.

A nose dive

that might have left us up in the air...

(based on actual Hartford Loss, File #H-20072)

It was a steep incline—about 30 degrees. Almost up, my motor stalled and I suddenly lost my air. With no brakes, no gears, me and that earth-mover back-tracked fast. I hit a bump and went flying. The rig "sashayed" completely around, and started high tailing downhill, headfirst. But the bucket caught. This drove the machine's nose deep into the dirt. And caused enough damage to leave the boss up in the air for $1461.39 . . . except that he had a *Hartford Contractors' Equipment Policy* that got things fixed up quick with no trouble or expense to him.

Who'd have paid this $1461.39 repair bill if this had been your machine?

Not you! *Not* if you had Hartford Contractors' Equipment Insurance. And your Hartford agent working with the company to see to it that your claim is paid promptly and fairly!

Your equipment investment is a big one. Get your Hartford agent or insurance broker to protect it for you . . . properly. In more than 5000 communities, you can locate your Hartford Fire Insurance Agent by calling Western Union by number and asking "Operator 25."

Year in and year out you'll do well with the

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SERVICISED PRODUCTS
for TILT-UP and PRE-CAST CONSTRUCTION

Cementone
SPONGE RUBBER JOINT FILLER

- Matches color of concrete
- Fully resilient—non-extruding
- Made in any degree of compressibility
- Supplied in any thickness, length

Seal tilt-up joints with resilient, non-extruding Servicised Sponge Rubber Joint Filler. May be cemented to concrete panel before being placed to speed erection and control compression of the joint. Servicised Calk-Crete caulking compound recommended to seal recessed joints when they are specified.

Curing and Separation
COMPOUNDS
Three Types:

- Curing Compound and Separation Membrane
- Separation Membrane for surfaces to be painted
- Separation Membrane

Servicised Curing Compounds and Separation Membranes are easily sprayed or painted on . . . are made in types to meet every requirement. All types meet ALL specifications. Positive separation or bond-breaking speeds construction . . . reduces costs.

Write for descriptive Catalog on Servicised Products. No obligation.

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INVESTIGATE Vibroflotation
Soil Compaction

for Industrial Foundations
Airports • Highways
Earth Dams • Levees
Deep Foundations
Concrete Dams

Before you plan foundations, determine if Vibroflotation is adaptable to your project. This modern process of granular soil compaction provides high bearing capacity at substantial savings . . . eliminates need for, or increases efficiency of piling and extensive spread-footings . . . solves problems of settlement under vibratory loads.

Write for new Bulletin . . . important facts for engineers about Vibroflotation.

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575 Sixth Ave. · Pittsburgh 19, Pa.
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Sauerman Scraper stores and reclaims 150,000 tons of stone on space between dock and cement mill.

Power Scraper Excavator: An economical machine for hill or pit excavation, reclamation and handling of materials, wet or dry. A rapid conveyor for long range earthmoving.

Slackline Cableway Excavator: Unequalled for operations that require deep digging, especially under water and delivery to a high point. Reaches hundreds of feet into ponds, sludge basins or similar areas, while operator remains in a safe location.

Tautline Cableway: This is a long range aerial crane designed for jobs requiring lifting, conveying and placing loads of unwieldy material. It is used in the building of dams and in quarry and open pit mine operations.

Drag Scraper Stockpiler: As with the above machines, storing and reclaiming with a Sauerman scraper storage machine is a one-man-control job. It is used to handle a wide variety of bulk storage material, both indoors and out.

Write today for illustrated catalogs.

Sauerman Bros. Inc.
532 S. Clinton St. Chicago 7, Ill.

OBITUARIES

Charles H. Hurd, 80, former chief engineer and later vice-president of the Indianapolis Water Co., Indianapolis, died July 9 in Fort Lauderdale, Fla. As a consulting engineer, he designed and constructed sewage disposal plants amounting to more than $100 million. Since 1918 he devoted his attention to water purification and sewage treatment projects. The sewage treatment known as "spiral flow" originated in Indianapolis under the supervision of Mr. Hurd, and now is in use in many cities. He was a graduate of the University of Chicago, later became a professor of experimental engineering at the Armour Institute of Technology, Chicago, and later opened offices in Indianapolis as a consulting engineer.

Percy S. Stephens, 78, one of western Canada's pioneer civil engineers, died recently in Saskatoon, Sask. He worked for Canadian Pacific and Canadian Northern during the region's railway construction boom around the turn of the century. Later he served as Manitoba inspector for the London and Canadian Loan Agency and as investment manager for Monarch Life Assurance Co.

Francis L. Mark, 56, asphalt paving technologist, died July 26 at Alexandria, Va. Manager since 1949 of the asphalt products department of Dewey and Almy Chemical Co., Cambridge, Mass., he was an expert in the development and use of additives for improving asphalt paving. Formerly he had served as sales technologist with the Lancaster Processes Co.

Harry J. Briggs, for 59 years a civil engineer for the city of Manchester, N. H., died in Manchester July 26. He was at one time connected with the Lakeport, N. H., Water Works, also Bartlett, Gay & Young.

Vincent Bressi, president of Bressi and Bevanda Constructors, Inc., died July 14 in Beverly Hills, Calif.

Earl F. Burtis, 60, civil engineer for the Bureau of Reclamation, died July 14 in Oakland, Calif. He received his engineering training at Colorado A. & M. and the University of Nebraska. Prior to moving to California in 1946 to work on the Central Valley Project and Monticello Dam, he was employed by the Nebraska state department of roads and irrigation.

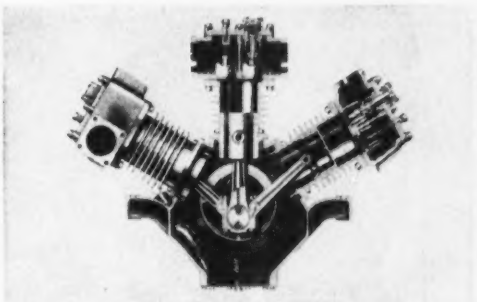
(*Continued on page 87*)

How long since you checked your compressor's fuel consumption?

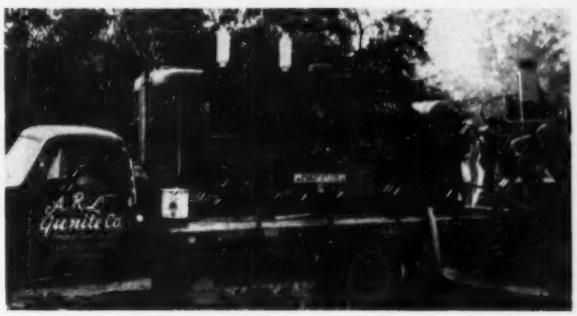
These figures will show you how Worthington Blue Brutes may save you as much as 1500 gallons of fuel during an average operating year

COMPRESSOR SIZE	ENGINE TYPE	GALLONS OF FUEL PER HOUR AT 80 PSI	GALLONS OF FUEL PER HOUR AT 100 PSI
60'	GASOLINE	1.31	1.42
105'	GASOLINE	2.16	2.35
	DIESEL	1.66	1.73
160'	GASOLINE	3.18	3.44
	DIESEL	2.45	2.60
210'	GASOLINE	4.32	4.70
	DIESEL	2.89	3.06
315'	GASOLINE	6.25	6.75
	DIESEL	4.38	4.64
600'	DIESEL	6.30	9.20

HOW DOES YOUR COMPRESSOR STACK UP in comparison with the Blue Brute for fuel economy? The figures shown have been determined under normal field operating conditions.



"SURE ARE EASY TO SERVICE." That's what we hear about Blue Brutes from mechanics all over the country. No special tools or complicated disassembly procedures are needed. And compressor uses same oil as engine.



PLENTY OF RESERVE HORSEPOWER is standard with the Blue Brutes. It takes thousands of hours of normal operation before engine wear affects the compressor's output. This means you get full-rated output even though the engine hasn't been in the shop for a long time.

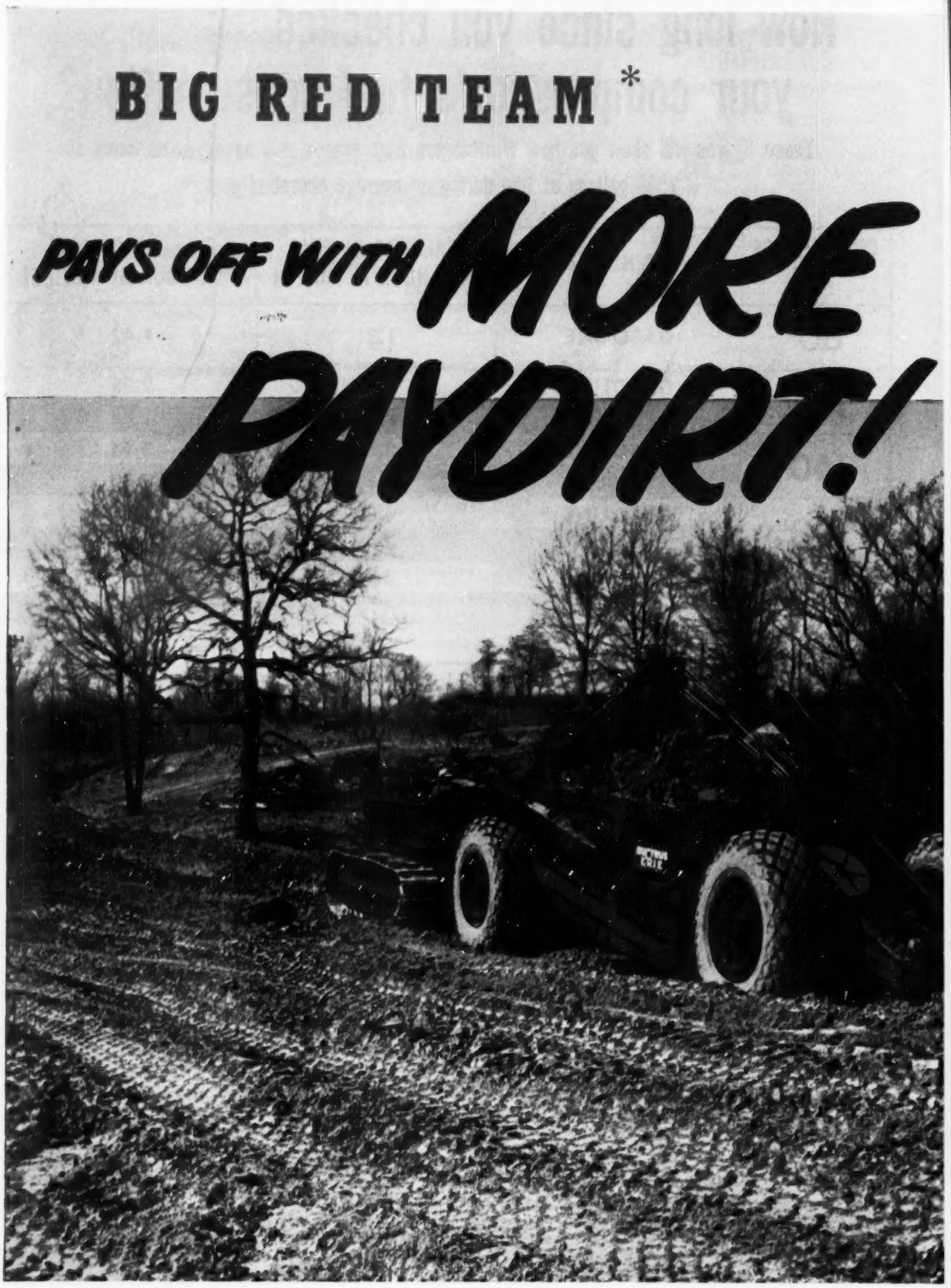
Get the rest of the Blue Brute story from your nearest Worthington distributor. Or write to Worthington Corporation, Construction Equipment Division, Section H.3.5, Plainfield, N. J

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A ***BLUE BRUTE*** *JOB*

H.3.5

ROCK DRILLS • WAGON DRILLS • PAVERS • CONCRETE MIXERS • PORTABLE PUMPS


BIG RED TEAM *
PAYS OFF WITH MORE PAYDIRT!

BIGGER LOADS EVERY TRIP . . .

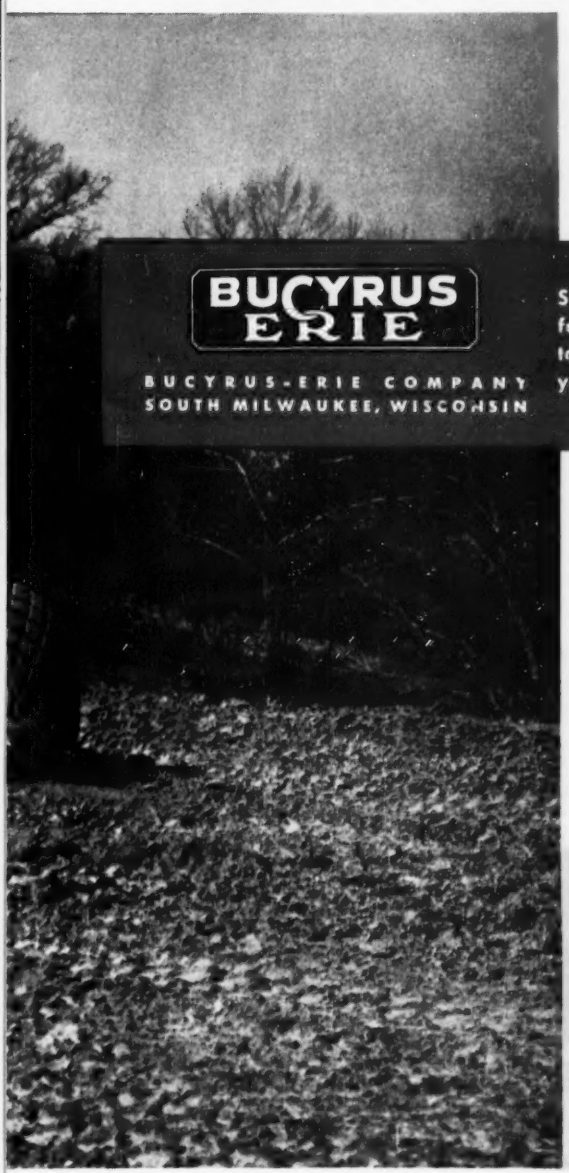
You get heaped loads faster with a Bucyrus-Erie scraper's boiling-action loading. This has been proved time and time again in actual field tests. The loading action breaks up big chunks to give you a compact and uniform fill, and extra pounds of dirt in every cubic yard.

MORE TRIPS PER DAY . . .

Big tires, low center of gravity and increased all around stability give you the flotation and maneuvering ability for extra trips every working day. The streamlined gooseneck permits short turns. Dumping is quick and clean with positive rolling ejection. It all adds up to faster hauling cycles . . . and more dirt moved per day.

11T53C

* Bucyrus-Erie scraper and TD-24 tractor



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SOUTH MILWAUKEE, WISCONSIN

See your International Industrial Tractor Distributor soon for all the facts about the Big Red Team . . . it will pay you to use the equipment that delivers the most paydirt for your money.

THREE *B*-TYPE SCRAPERS TO CHOOSE FROM

Model	Capacity	
	Struck	Heaped
B-250	22 cu. yd.	27½ cu. yd.
B-170A	16 cu. yd.	21 cu. yd.
B-113	10 cu. yd.	14 cu. yd.

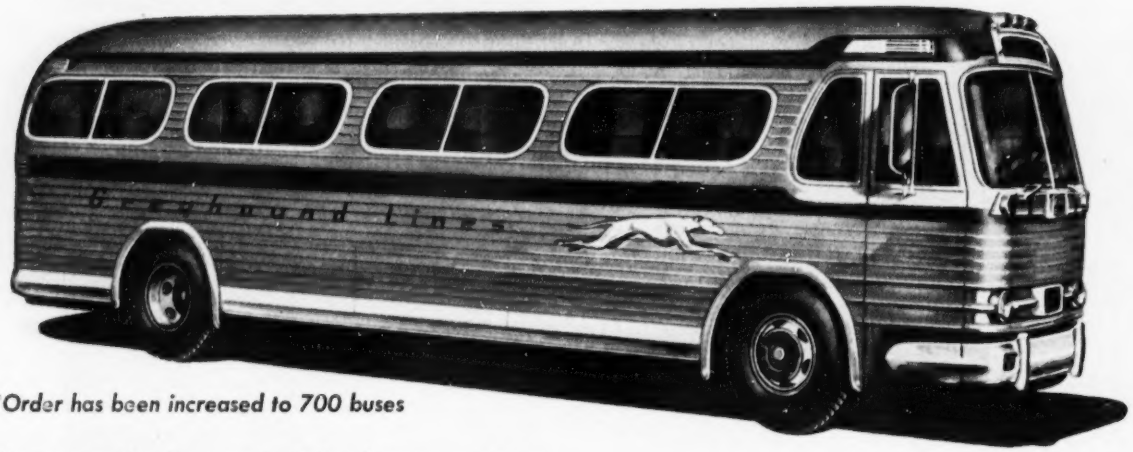
SEE YOUR INTERNATIONAL INDUSTRIAL TRACTOR DISTRIBUTOR

FOR GREATER SAFETY

Greyhound Specified

VICKERS HYDRAULIC POWER STEERING

700* on 400 New Coaches



*Order has been increased to 700 buses

Always searching for ways to further increase passenger safety, Greyhound Lines selected Vickers Hydraulic Power Steering for the 400 new Model PD-4104 GM Coaches recently purchased. 700*

Vickers Hydraulic Power Steering prevents the possible loss of driver control when a vehicle is forced off the pavement onto a soft shoulder . . . or when a front tire blows out. Extra steering power and quick maneuverability are always available for emergency conditions.

The Vickers System absorbs all road shock and transmits it to the vehicle frame . . . there can be no kick-back at the steering wheel. The driver supplies only enough effort to slightly move a servo valve . . . fatigue is thus greatly reduced and the driver is more alert.

Only minor alterations are usually required to incorporate Vickers Hydraulic Power Steering in new and existing vehicle designs. For further information, ask for new Bulletin M-5104.

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VICKERS hydraulic

POWER STEERING

is Effortless

Positive and Shockless

6478

Vickers Hydraulic Power Steering Booster does the actual work of steering

Engine-driven Vickers Vane Pump (with integral volume control and relief valves, and oil reservoir) supplies power for steering.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

OBITUARIES

W. Sidney Harvey, 72, city engineer at Warren, Ohio, for more than 30 years, who had retired Jan. 1, 1951, died July 31. After a year of retirement, he worked as a consulting engineer for the Warren Engineering Co. He went to Warren in 1919 as chief engineer for Alexander Potter Co., consulting engineers, of New York.

George G. Schmidt, Indianapolis, Ind., former Marion County engineer, died July 29. He started his own company, George G. Schmidt & Co., Indianapolis, for surveying work, 38 years ago. Among other projects, he helped plan the city of Hollywood, Fla., in 1921, and laid out many small towns near Indianapolis.

Joseph E. Jewett, 53, Chief of the Engineering Division of the Upper Mississippi Valley Division, Corps of Engineers, died July 20 in St. Louis. He entered the corps in 1930, serving in the Upper Mississippi Valley Division for 15½ years and in the Rock Island, Ill., district for 7½ years. During World War II he engineered for a $400-million military construction program. Recent duties included planning and design for navigation locks and dams and major flood control works.

Theodore W. Knowlton, 80, New York civil engineer and chairman of the board of directors of Knowlton Brothers Paper Co., died July 19 in Watertown, N. Y. An 1893 graduate of Rensselaer Polytechnic Institute, he joined Knowlton Brothers 21 years ago and served as president until becoming board chairman in 1948.

Albertus De Friest, 64, civil engineer, died July 26 in Los Angeles. As chief engineer of the Union Pacific bridge section, he designed many of the railroad bridges in southern California. Later, as chief engineer for the F. J. Holsor General Contracting Co., he designed the Coos Bay and Yaquiam Bay bridges in Oregon.

Frank F. Matthews, 84, who was a civil engineer for the New England Telephone & Telegraph Company, Boston for 40 years until his retirement 20 years ago, died at Boston on July 27.

Theodore Green, 71, a civil engineer, died Aug. 2 in Buffalo, N. Y. He was president of the Hydro Construction Co. of Buffalo. A graduate of Massachusetts Institute of Technology, he became a partner in the firm in 1914, and its president in 1928.

NEW DRIVE-IT 320 with BREAK-OPEN ACTION

MAKES SPLIT-SECOND FASTENING TO CONCRETE OR STEEL... EASIER THAN EVER

BREAK-OPEN ACTION for fast, easy loading and extraction makes new **DRIVE-IT** "320" the easiest operating stud driver on the market. This smooth-working action means a greater saving to you on concrete or steel fastenings.

Here are other exclusive **DRIVE-IT** features that make it the best tool available:

ONE POWER LOAD. No need to buy and stock various strength power loads with exclusive **DRIVE-IT** power control method.

AUTOMATIC EXTENSION BARREL allows fastenings inside junction boxes and other recesses. No need to buy and attach extra barrels.

SWIVEL SAFETY PAD of tough rubber and steel protects operator and permits fastenings next to walls.

SAFE two-handed firing sequence and length of tool offer maximum protection. Can't be discharged accidentally or in mid-air.

DRIVE-IT pins are listed and approved by Underwriters' Laboratories.

DRIVE-IT the original POWDER ACTUATED TOOL

MAIL NOW FOR MORE INFORMATION

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☐ We would like a free demonstration of DRIVE-IT.
☐ Please send literature on new DRIVE-IT 320.

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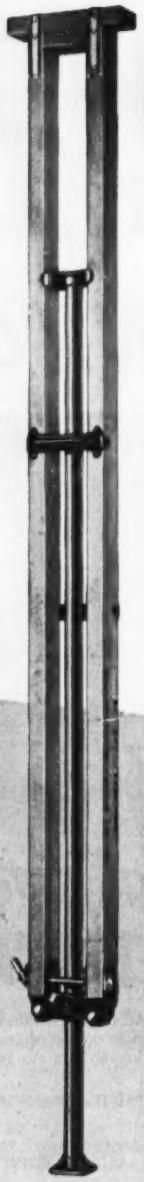
Rooshor Head
Wood or steel head with holes for nailing into stringers. Roos Extension Shores take any length 4 x 4 extension.

Wood Upper Member
Permits ease in horizontal or diagonal bracing. No problem of placing an extra bracket or hitting a "set" hole in a steel member.

Steel Pipe, Concrete-Filled
1¼" steel pipe filled with concrete . . . will not crush or buckle.

Rooshor Lock Will Not Slip!
This exclusive lock acts like a pair of giant tongs — the greater the load, the greater the grip.



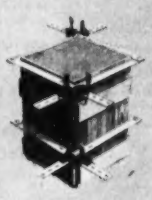
Contractors prefer Rooshors because . . .

Rooshors save time, material and labor . . . so naturally they cut costs on all your shoring operations. They are easily set — instantly and accurately adjusted to any fraction of an inch by *only one* man. There are no loose pins and no screw adjustments to become clogged. They have longer adjustment in their range of three sizes: 8 ft. to 14 ft.; 7 ft. to 13 ft.; and 5 ft. to 9 ft. — higher stories are shored with Roos Extension Shores. Rooshors have been used by contractors from coast to coast and in many foreign countries for over 35 years.

Rooshors and Roos Column Clamps are available for rental with purchase option from Warehouse stocks in principal cities. New equipment is for sale FOB factory.

ROOS COLUMN CLAMPS

Roos Column Clamps, consisting of two identical hinged units, eliminate lost time and motion in fitting and adjusting . . . there is no wrong way to put them on. They have no loose parts to cause needless delays and a hammer is the only tool needed.



BAKER-ROOS, INC.
602 WEST McCARTY STREET
INDIANAPOLIS 6, INDIANA

WRITE TODAY FOR BULLETIN — 353

LEGAL

Unlicensed contractors

In some states local statutes make it illegal for any one to engage in the contracting business unless he has obtained a license to engage in such business. Thus in Virginia, a statute provides: "It shall be unlawful for any person to engage in, or offer to engage in, general contracting or subcontracting in this state, unless he has been duly licensed and issued a certificate of registration under the provisions of this chapter." The statute also provides that a violation of the statute shall constitute a misdemeanor.

In a case brought to test the constitutionality of the law[1] the court held that a contractor who was not duly licensed could not recover for contracting work done. The court pointed out also that the courts of Virginia have upheld statutes requiring real estate brokers and plumbers to obtain licenses.

It might also be pointed out that in localities where statutes require engineers and architects to be licensed, no recovery can be had for services rendered in the absence of the required license.

(1) F. S. Bowen Electric Co., Inc. v. Foley et al., 72 S.E. 2d 388, Supreme Court of Appeals of Virginia, Sept. 10, 1952.

Plans and specifications made part of contract

"Where a contract by express terms makes plans and specifications a part of itself, they will control with the same force as though incorporated in the contract itself. Aetna Indemnity Co. v. Waters, 110 Md. 673, 73 A. 712."[1]

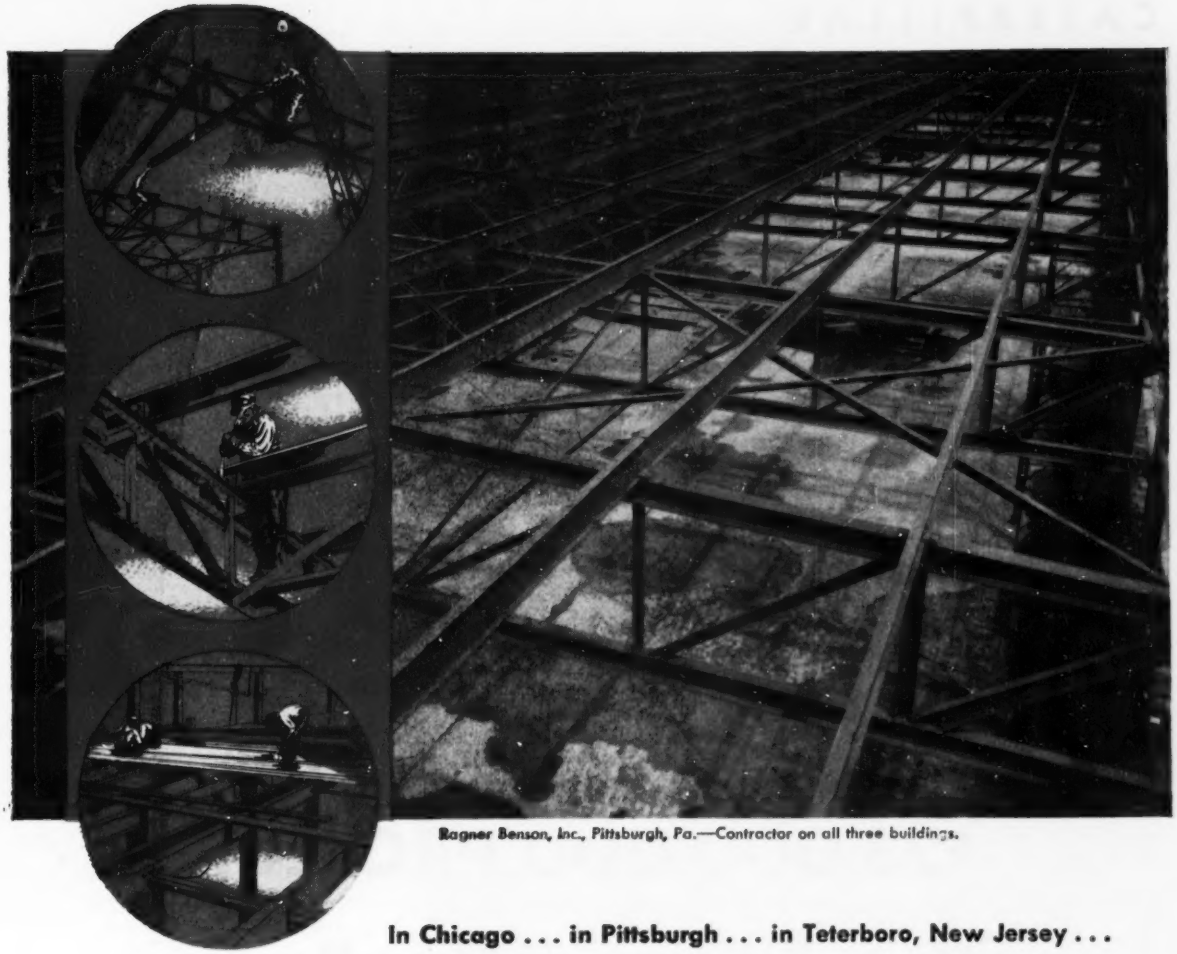
(1) Gaybis v. Lalm et ux., 93 A. 2d 269, Court of Appeals of Maryland, Dec. 3, 1952.

Approximate estimates

Litigation has often arisen out of the meaning of the term "approximate estimates." Thus, in one case a contractor submitted an approximate estimate of the cost of doing some work. The cost exceeded that approximate estimate and the other party refused to pay the excess cost. The contractor brought an action[1] to recover the excess, and was allowed a recovery by the court.

The court in its opinion indicated that to make an estimate ordinarily means to calculate roughly, or to form an opinion as to the amount from imperfect data. The use of the word

(*Continued on page 92*)



Ragner Benson, Inc., Pittsburgh, Pa.—Contractor on all three buildings.

In Chicago . . . in Pittsburgh . . . in Teterboro, New Jersey . . .

the Ford Motor Company uses

J&L JUNIOR BEAMS

Three new Parts Depots now being built for the Ford Motor Company illustrate the versatility and adaptability of J&L JUNIOR BEAMS for all types of building construction. More and more architects, builders and contractors are recommending lightweight J&L JUNIOR BEAMS to solve their design problems.

Besides fast, economical construction—JUNIOR BEAMS allow for maximum safety, permanence of construction, functionality of design—and, still maintain a low over-all cost.

You'll also be interested in these other important features offered by J&L JUNIOR BEAMS. They are:

EASY TO INSTALL	SHRINK PROOF
RIGID	FIRE PROOF
VIBRATION RESISTANT	VERMIN PROOF

and have the **LOWEST DEFLECTION FACTOR OF ANY STRUCTURAL SECTION OF EQUIVALENT WEIGHT.**

Write today for our new booklet covering J&L JUNIOR BEAMS AND CHANNELS. It shows how JUNIOR BEAMS are used as floor joists and roof purlins, with loading and spacing tables for various spans.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH

Jones & Laughlin Steel Corporation
428 Gateway Center, Pittsburgh 30, Pennsylvania

Please send me a copy of the booklet covering J&L JUNIOR BEAMS AND CHANNELS.

Name_____

Company_____

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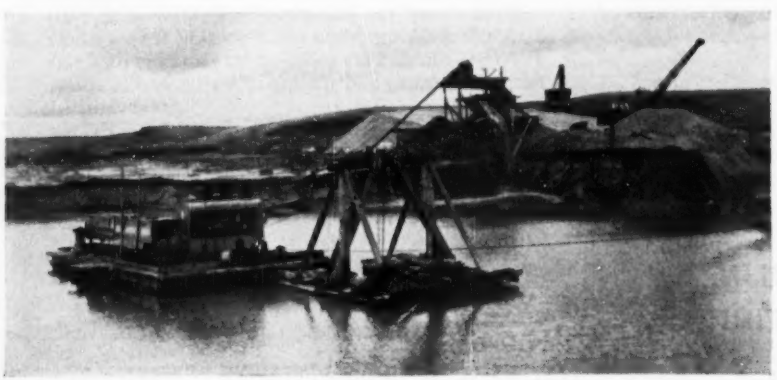
_____

$23,000,000 PROJECT with a Billion-dollar Benefit

Now about 90 per cent completed, the Trenton Dam, in southwestern Nebraska near the Kansas line, promises to return many times its cost to the farmers and taxpayers of the Great Plains area.

In the past 20 years alone, the rampaging Republican River has caused losses by flood damage far greater than the total cost of the new construction. But flood control is only one of the advantages brought by the dam. Erosion and wind have made this part of the country a typical dust-bowl region, and many thousands of acres of land will soon be made fertile by irrigation. The reservoir behind Trenton Dam will have a shore line of 45 miles and a capacity of 365,000 acre-feet. It will provide fishing and other recreational facilities and will be an aid to wildlife propagation.



This 8-inch dredge pump is powered by a Caterpillar D13000 Engine. Owner A. L. Davidson, of Davidson-Merritt, Indianola, Nebraska, says: "From every angle, Caterpillar Engines are the best and most economical we have ever had in 25 years' experience."

A Caterpillar D8 Tractor with No. 8A Bulldozer feeds loose material to the P&H 5-yard dragline, powered by a Cat D375 Engine. Owned by Vinnell-United-Bell, Trenton, Nebraska.

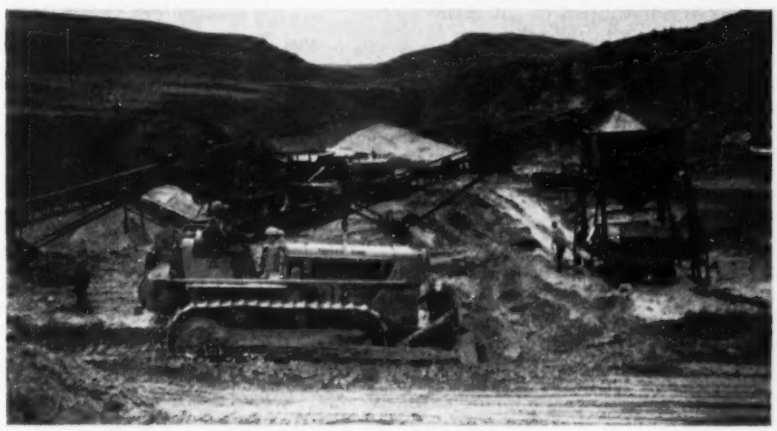
The project is under the control of the U. S. Department of the Interior, Bureau of Reclamation. It involves a large number of major contracts, not only for building the dam itself but for railroad and highway relocation and irrigation canals.

Of rolled earthfill construction, the dam is 9,000 feet long, 800 feet wide at the base and 30 feet at the crest. Its volume is 8,000,000 cubic yards. In addition, more than 10,000,000 cubic yards of material must be moved to complete other parts of the project.

As on every big job of this kind, Caterpillar* Equipment is much in evidence. Excavators, compressors, dredges and crushers are powered by Caterpillar Engines. Cat* Diesel Tractors and Motor Graders are used for bulldozing, hauling and road maintenance.

Most of these contractors have proved by long experience that standardizing on the big yellow machines is profitable. Under dusty conditions such as prevail here, Caterpillar filters, seals, air cleaners and other exclusive design features offer top protection against clogging, abrasion and resultant down time. The problem of stocking parts is simplified by standardization. And service by a single nearby dealer, backed by the resources of one responsible manufacturer, helps keep the machines steadily at work.

A rock-crushing plant near Trenton Dam is powered by a Cat D17000 Engine. This plant, and the D6 working in foreground, are owned by C. L. Hubner Co., Denver, Colo.



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"estimate" precludes accuracy. This is especially true in cases where the contract provides for "approximate monthly estimates".

In another case[3] the court held that an estimate of the cost of lumber for a proposed building, taken in its ordinary meaning, excluded the idea of an exact schedule of material, not to be increased or diminished as the building progressed, but on the contrary was an approximate estimate of the quantity of lumber that might be required.

[1] Beeler v. Miller, 254 S.W. 2d 986, Kansas City Court of Appeals, 1953.
[3] Mills-Carleton Co. v. Huberty, 84 Ohio St. 81, 95 N.E. 383.

Promise to supply labor held binding on contractor

A promise by a general contractor to pay for materials and labor furnished to a subcontractor, made in order to assure the performance of the subcontract, will be enforced.

In a recent case[1] the court held that where the labor and materials were furnished in reliance on the promise on the part of the general contractor to pay for the same, such promise constituted a sufficient consideration to support the promise. This is particularly true where the party was reluctant to furnish such materials and labor because of the insolvency of the subcontractor.

[1] Curtis Mfg. & Asbestos Co. v. W. D. Bates Const. Co., Inc., 94 A. 2d 550, Supreme Court of New Hampshire, Feb. 3, 1953.

Substantial performance of construction contracts

While as a general rule, a person who has failed to fully perform his contract is not entitled to any recovery, an exception to the rule exists in contracts for building and construction work under which the contractor is allowed payment where he can show substantial performance of the contract.[1]

The true rule that building contracts form a well-recognized exception to the rule exacting strict performance is set forth in 9 Corpus Juris, Section on Building and Construction Contracts, pages 820-821, and 17 Corpus Juris Secundum, Sections 508, 509 and 786.

(1) Williams v. Board of Public Instruction, 61 So. 2d 493, Supreme Court of Florida, Oct. 24, 1952.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

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HEILINER	.57	.30	4.87	18-yd.	50,350 lbs.
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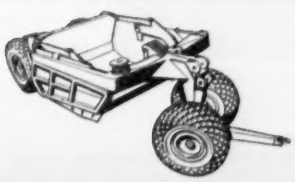

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Compare a Lorain-50 shovel *in action* with any other make. Compare design features and what they do for you, and you'll see why your investment in a Lorain will pay off.

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These, plus many other features, make up the famous Lorain *"balanced quality"* throughout the machine. For best proof of Lorain-50 features, see one *in action!*

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BOOKS

Roof truss design

SIMPLIFIED DESIGN OF ROOF TRUSSES FOR ARCHITECTS AND BUILDERS—SECOND Edition. By Harry Parker. 278 pp. John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. $4.00

Major change in the new edition is the addition of a fourth part dealing with the design of timber roof trusses with steel connectors. Also, new tables, charts and formulas have been incorporated for the design of struts and ties that are to be connected with toothed or split rings.

Numerous changes have also been made in Part III to bring the book up to date with allowable stresses and column formulas in current use.

The original edition of this book was intended primarily for those who have had no preliminary training in the design of roof trusses. The changes and additions are written in the same spirit.

Tilt-up handbook

MANUAL OF PRECAST CONCRETE CONSTRUCTION—By F. Thomas Collins, 71 pp. F. Thomas Collins & Associates, Box 212, San Gabriel, Calif. $25.

This paper-covered book gathers together know-how on precast concrete construction, with particular emphasis on tilt-up operations. It covers casting of wall panels on flat surfaces, erection and anchorage.

The manual provides a summary of field methods rather than design—except, of course, that in this construction procedure, designs must take into account construction sequences. Thus, provision must be made in design for resistance to lifting stresses, for casting in the lifting devices, for pouring columns. Such details are well covered. Many sketches by the author are used to bring out specific points.

New engineering books

HISTORY OF STRENGTH OF MATERIALS—By Stephen P. Timoshenko. 452 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $10.00.

ENGINEERING DRAWING—By Josef V. Lombardo, Albert J. Lombardo, Lewis O. Johnson, and W. Irwin Short. 432 pp. Barnes & Noble, 105 Fifth Ave., New York 3, N. Y. $2.00.

PRACTICAL GUIDANCE METHODS for Counselors, Teachers and Administrators—By Robert H. Knapp. 319 pp. McGraw-

(Continued on page 99)

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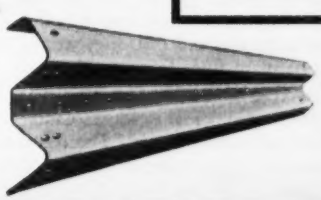

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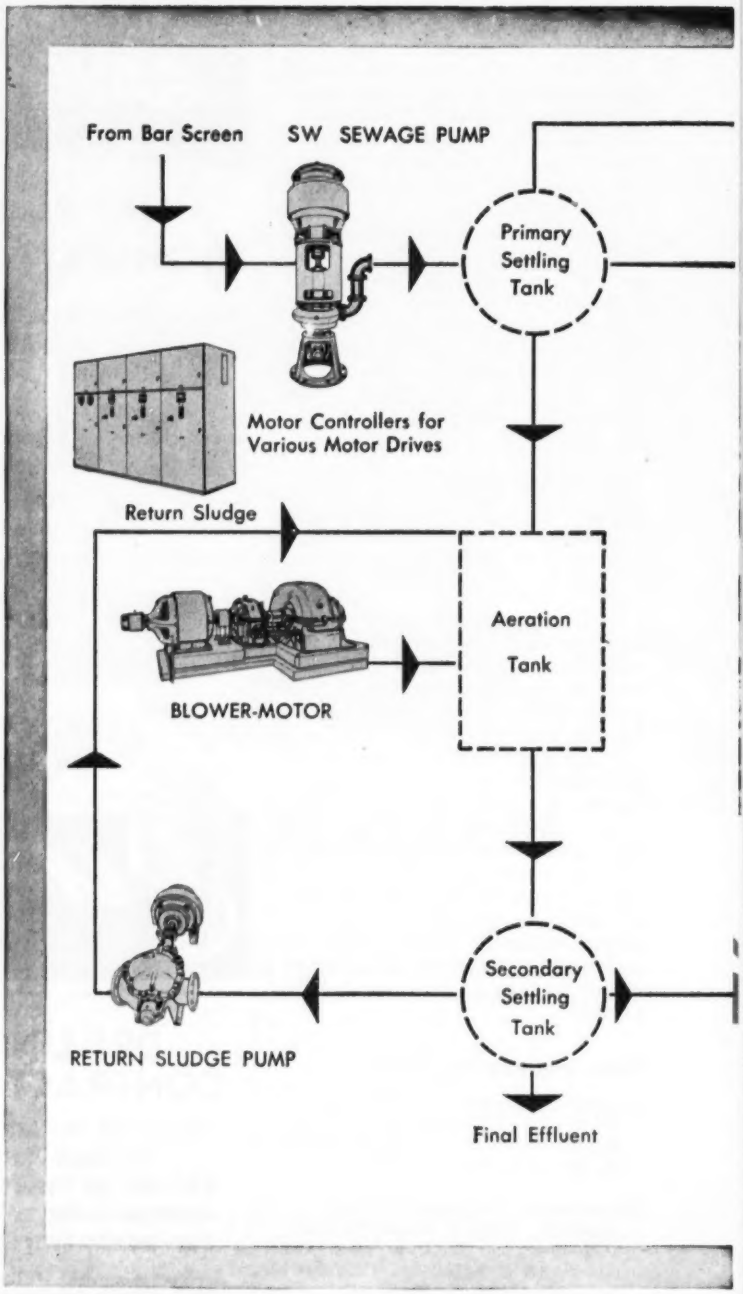
How to make Sewage



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Already, sale of fertilizer is netting a midwestern metropolis over two-thirds the cost of operation. Another city is planning to burn its sludge cake in the belief that this will prove even more profitable than fertilizer sales. And digester gas is supplying 90% of the sewage power and light needs of a large eastern city.

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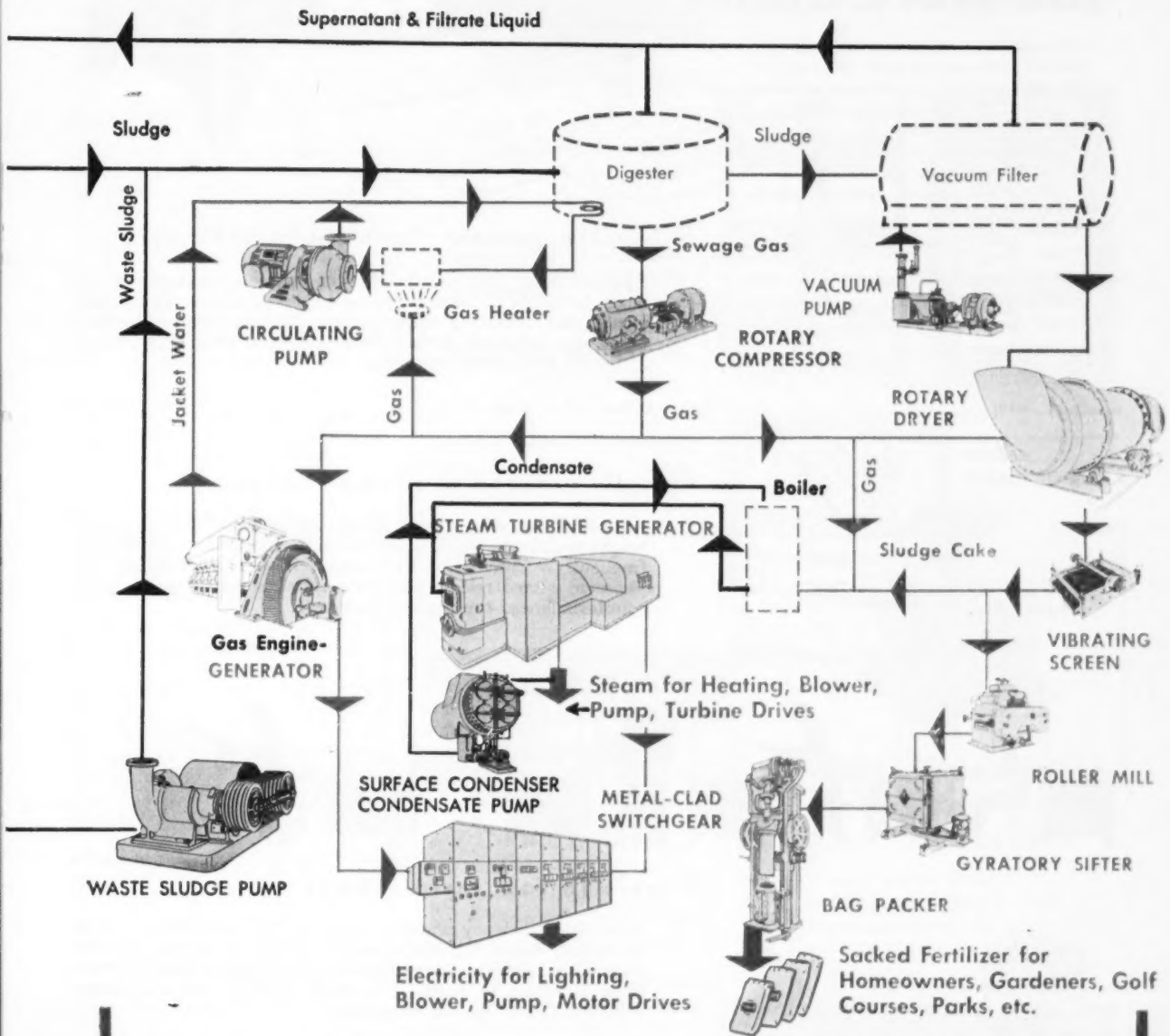
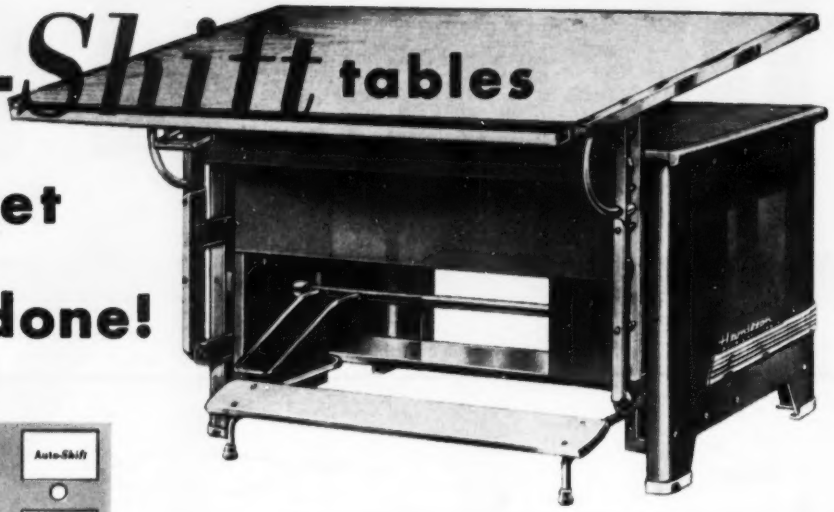
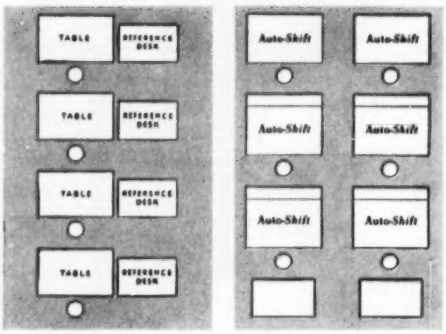


ACTIVATED SLUDGE FLOWSHEET DIAGRAM

Byproduct Utilization Processes Shown in Color

Auto-*Shift* tables help get the work done!





30-50% greater floor space efficiency

Approximately 250 sq. ft. of floor space accommodates *two more* Auto-*Shifts* than board-next-to-desk tables. Space efficiency *and* operating efficiency are greater, since Auto-*Shift* puts large reference surface directly behind each draftsman—instantly, effortlessly accessible.

HEIGHT ADJUSTMENT

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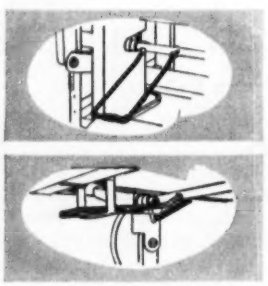
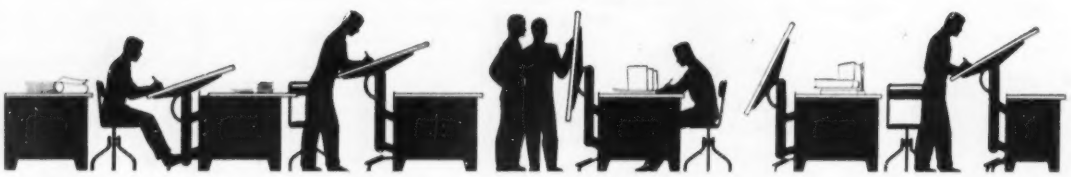


Greatly reduced draftsman fatigue

Auto-*Shift* provides rapid, simple adjustment of both board height and slope—permits draftsmen to change working position frequently. Convenient foot release frees top for height adjustment—hand release permits rapid slope adjustment. Fully counterbalanced top moves effortlessly.



Excels in row installations

Auto-*Shift* efficiency reaches a peak in row installations. Each draftsman has a full-size extension reference surface directly behind him, generous drawer space immediately at hand. Everything is where he needs it to work quickly and accurately. Auto-*Shift* helps get the work done!

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Get all the Auto-Shift facts, including new range of sizes, data on new models for use at front and rear of row installations. Write for your copy today.

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BOOKS

Hill Book Co., 330 West 42nd St., New York 36, N. Y. $4.25.

SPECIFICATIONS—By H. Griffith Edwards. 311 pp. D. Van Nostrand Co., 250 Fourth Ave., New York 3, N. Y. $5.00.

FUNDAMENTALS OF STRUCTURAL ANALYSIS—By A. A. Jakkula and Henson K. Stephenson. 288 pp. D. Van Nostrand Co., 250 Fourth Ave., New York 3, N. Y. $4.50.

STRESS WAVES IN SOLIDS—By H. Kolsky. 211 pp. Oxford University Press, 114 Fifth Ave., New York 11, N. Y. $5.00.

Reports and pamphlets

METHOD OF CONVERTING HEAVY MOTOR VEHICLE LOADS INTO EQUIVALENT DESIGN LOADS ON THE BASIS OF MAXIMUM BENDING MOMENTS—Bulletin 127, Texas Engineering Experiment Station, College Station, Tex. $3.00.

A PLAN FOR HIGHWAY CLASSIFICATION IN MAINE—An Engineering Report to the Maine Highway Commission. Prepared by the Automotive Safety Foundation, 700 Hill Bldg., Washington 6, D. C.

AIR POLLUTION ABATEMENT MANUAL—Manufacturing Chemists' Association, Inc., 246 Woodward Bldg., 15th and H Sts., N. W., Washington 5, D. C. 75¢.

SUCCESS THROUGH WELDING—The Lincoln Electric Company, Cleveland 17, Ohio. 50¢.

Miscellaneous Notes

• **Clemens Herschel and the Venturi Meter** are the subject of a pamphlet issued by Builders-Providence, Inc., 345 Harris Ave., Providence, R. I. Its chief purpose is to make available in convenient form information on Mr. Herschel and his development of the flow meter that he named after the great Italian hydraulician, Giovanni Battista Venturi.

• **Parshall Flumes of Large Size,** a pamphlet issued originally as Bulletin 386 of the Colorado Agricultural Experiment Station, out of print for some time, has been reprinted as Bulletin 426A of the station. Copies can be obtained without charge from the station at Fort Collins, Colo.

• **A guide for airport designers** to help them determine what size buildings are required for anticipated air traffic has been issued by the Civil Aeronautics Administration under the title "Airport Terminal Buildings." Copies can be obtained from the Superintendent of Documents, Washington 25, D. C. for 25¢.

This complete, instructive collection of information about soil sampling in all subsurface conditions, shallow or deep, with hand or power driven tools, is yours for the asking. Modern sampling techniques are discussed with recommendations as to tools and accessories best suited for fast, accurate, economical sampling.

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Charles Andrew, West Coast engineer proves by his record that . . .

Showmanship and psychology sell bridges

"It's not nearly as hard to build a bridge as to get them to let you build it."

By "them," Charles Andrew, chief consulting engineer for the Washington State Toll Bridge Authority, refers to the public generally and its elected officials specifically, as well as financial agencies, insurance companies, etc., which must be consulted preliminary to the actual construction of a large toll bridge.

"Charley" Andrew speaks from the experience of building three of the most publicized bridges in the world—the San Francisco Bay bridge, the Lake Washington floating bridge, east of Seattle, and the reconstruction of the Tacoma Narrows suspension bridge, whose collapse in 1940 led to pioneering studies of the aerodynamic characteristics that are found in suspension structures.

With these three "selling" jobs behind him, Andrew faces with confidence a new project: The proposed $115-million bridging of Puget Sound and Hood Canal west of Seattle, which promises some interesting problems in design and building as well as in the "getting-them-to-let-you-build-it" stage.

• **First, the proposal**—Andrew works from a blueprint in the promotion of a project just as much as he does in its construction.

In the case of the Puget Sound project, his promotion began some five years ago. Before anyone else had the temerity even to suggest bridging the sound, whose rough waters are deeper than the waters under any existing bridge and several miles wide at the narrowest points, he caught the public's fancy by suggesting a traffic tube submerged below the surface of the water.

"You don't have to be a psychologist to sell the idea of a bridge," confides Andrew, "—but it helps."

His timing was good, for fares were increasing on the cross-sound ferries while service was decreasing, leading to a public clamor that later was to result in state acquisition of the routes. The suggestion that the ferries could be replaced with bridges was happily received.

• **Now prove it**—Andrew turned to the problem of proving that a Puget Sound bridge could pay for itself. Good evidence was provided by traffic surveys that led bond houses to venture the opinion the project was financially feasible.

During all this time, Andrew had refused to be pinned down to one location for the proposed crossing. True to one of his own maxims—"don't fight over locations"—Andrew had mentioned four possible sites. In 1951, however, he felt it was time for his conclusions to be checked and a site to be selected, so the Toll Bridge Authority, at Andrew's suggestion, named a board of consulting engineers to do just that.

This board late last year found the project could be "easily" financed from tolls and was therefore feasible, from a financial as well as an engineering point of view. Checking Andrew's report, it recommended a concrete floating bridge, with fixed approaches from a point in Seattle's Fauntleroy district to Vashon Island, with a suspension bridge from Vashon to the Kitsap mainland. A few days later, the Toll Bridge Authority accepted the engineers' report.

• **Then fight for it**—An engineer with less experience in dealing with the public might have assumed at this point that the battle was won and all he had to do was go out and build the bridge. Charley Andrew knew better.

Selection of the site immediately brought protests from advocates of the other sites, who carried their battle to the state legislature with such effectiveness that it appeared for a time the project was doomed for a delay of at least two years. Finally, however, the legislature early this year allotted

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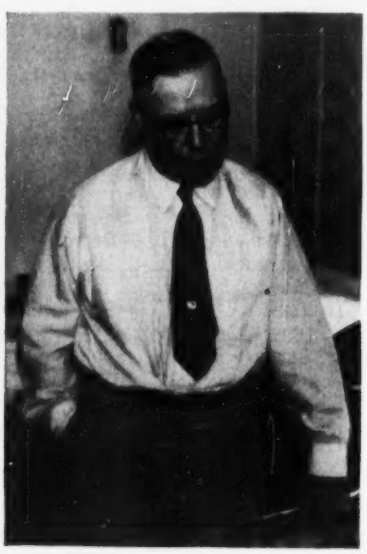
$700,000 toward completing plans, leaving the location to be determined by the Toll Bridge Authority after "further studies." Accordingly, the authority has applied to the Corps of Engineers for permission to build bridges at three locations on Puget Sound and at one on Hood Canal.

The corps held a public hearing in July on the relatively non-controversial Hood Canal crossing, between the Kitsap Peninsula and the Olympic Peninsula to the west. Hearings for the other locations started Aug. 11 (on Route No. 1, via Vashon Island); Aug. 27, on Route No. 2, from Alki Point in Seattle to Bainbridge Island; and Sept. 3, on Route No. 3, from West Point in Seattle to Bainbridge Island, with a second bridge to the west from Bainbridge across Port Orchard Bay to the Kitsap Peninsula. Only one route will be bridged over Puget Sound.

Advocates of the Bainbridge Island routes are unhappy over the hearings, contending the "further studies" ordered by the legislature should be made first, but Andrew replies that studies cannot be made intelligently until the Corps of Engineers' requirements on clearances for the various crossings are determined.

Chances are, after all the hearings have been held, that Route No. 1, favored by the consulting engineers and by Andrew, will still be favored. It is possible that the Navy will veto any bridge over the channel leading to its Bremerton Navy Yard, a veto which would clear only the structure to Vashon Island.

If you should attend one of these



AN ANDREW MAXIM: "Don't fight over locations."

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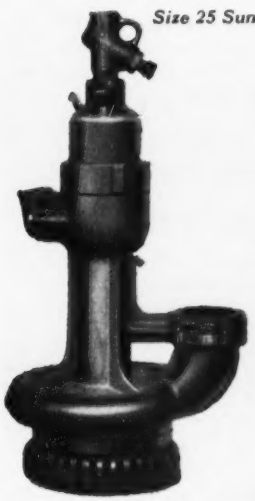

Size 25 Sump Pump.

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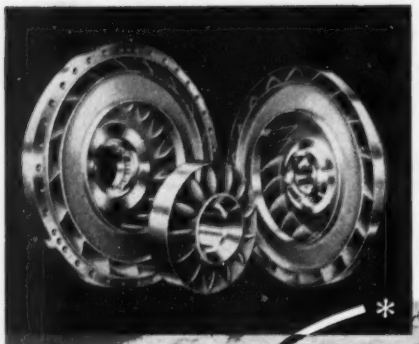

Eventually EVERY Shovel Will be TORQUE CONVERTER Driven But You Can Profit by its advantages NOW with a MANITOWOC

Get *extra* yardage, higher daily output, faster cycles, more bail pull, less breakage, smoother operation with a TORQUE CONVERTER equipped MANITOWOC.

Gives you *extra* power for tough going — smoother, faster acceleration throughout the entire cycle — enables you to handle bigger loads, shock loads, jars and jolts without damage to mechanism.

It's the greatest advancement in shovel history — and it's yours NOW, in the Manitowoc line. Manitowoc pioneered this development — more than twelve years ago — hundreds of units now operating. The big swing is to the mighty Manitowocs — Torque Converter driven. Get complete details from Manitowoc Engineering Corp., Manitowoc, Wisconsin.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 18-100 TON

* BALANCED POWER

Engine operates at maximum efficiency at all times — full engine power for full loads — just enough power for light loads — automatically selected. Engine cannot be stalled — no delays waiting for engine to pick up speed.

SMOOTHER OPERATION

Oil cushion absorbs jolts and jars. Saves cables, clutches, gears and assemblies. Less down time means more yardage.

PRECISE CONTROL

"Fraction of inch" control by either hand throttle or foot accelerator, without slipping clutches or shifting speeds. Makes an expert out of an average operator. Ideal for crane service, setting steel and stone, and general erection work.

hearings, or any other meeting in regard to the Puget Sound bridges, you wouldn't have much trouble in finding Andrew, for he probably will be near the center of attention. Sitting as solidly as one of his bridges, he'll likely have a cigar in the corner of his mouth and a quizzical expression of good-humored interest on his ruddy face as he listens to some one expound the merits of another route or another type of design.

"Maybe so," he'll answer if given the chance, in a drawl that dates back to his youth on a farm near Oregon, Ill., "BUT—" and bang will go a lot of balloons.

Andrew has a theory of how an engineer should conduct himself in the face of public criticism—"stick to what you think is right and go ahead." This theory dates back to his first public job, as city engineer at St. Johns, Ore., in 1907-12.

Before that time, the 1906 civil engineering graduate of the University of Illinois had been working for Ralph Modjeski of Chicago on railroad bridges in the Pacific Northwest. The carpenter foreman on one of the jobs was elected mayor of St. John, a suburb of Portland, and persuaded Andrew to become his city engineer. The mayor didn't last long (only a year) but Andrew continued as engineer for five years, under five mayors, and "got along with all of them."

A top spot for him was the day several years ago when his rebuilt Tacoma Narrows bridge withstood a wind of 75 mph without a wiggle, after the original bridge had collapsed in a wind half as strong.

Andrew had taken no part in the design of the original bridge. He had been busy with construction of the Lake Washington floating bridge since 1938, his first project for the Washington State Toll Bridge Authority. Previously he'd been with the California Toll Bridge Authority, (for eight years) as principal engineer for the San Francisco Bay bridge.

Collapse of the first Tacoma Narrows Bridge (ENR Nov. 14, 1940, p. 1) drew the attention of engineers from all over the world and led to studies that have resulted in changes in suspension bridge design. After World War II, the Toll Bridge Authority ordered Andrew to prepare plans for the heavier, wider and stiffer bridge that was opened to traffic several years ago.

• **Tough selling**—The engineer remembers the Lake Washington bridge as the toughest selling job. The publisher of one of Seattle's daily newspapers put on a strong campaign against the bridge, complaining it would be an eyesore, spoil boating on the lake, lower property values and blow away in the first storm. Andrew stuck to his guns and had the satisfaction, a few days before the bridge was opened to traffic, of hearing the publisher admit he was wrong and requesting a preview trip over the structure.

HE LISTENS quietly to opposing ideas, then punctures them.

Today, the toll-free bridge is Seattle's No. 1 tourist attraction and some of the city's finest homes have been built within a stone's throw of its approaches.

Big as the Puget Sound bridge will be, it will not be as big as the San Francisco Bay bridge on which Andrew was the principal engineer from 1930 to 1938, after starting the layouts as California state bridge engineer in 1927-30. The San Francisco bridge still will be the biggest in the world, from the standpoint of steel tonnage (168,000 tons) and length (almost 8 mi). Foundations of that bridge still are the world's deepest, going down 247 ft under water.

The Puget Sound crossing will be

what's NEW in Engineering

The shortage of engineers in all fields, according to three leading universities, will continue until 1955 or 1956. Then, a more balanced supply and demand picture should emerge—thanks to heavy registration of engineering students in the past two years. Meanwhile, one major university reports that in June they had over 4,000 jobs on file—open to 260 graduates.

Microscopic sea plants, called diatomaceae, are getting a lot of attention at Lompoc, California. Deposited geologic ages ago on the floor of what was then an island sea, their fossils are highly valued in many industries for filtering, refining, and other processes. To utilize

the huge deposits at Lompoc, Kaiser Engineers recently designed and built one of the largest and most modern Dicalite plants in the nation for Great Lakes Carbon Corp. We'll send you a reprint of an article in *Industrial and Engineering Chemistry* which tells the story of Lompoc's diatoms.

Chi-Teh Wang, N. Y. U. aeronautical engineering professor, has written a book on a new approach to elasticity. To be published by McGraw-Hill in August, *Applied Elasticity* presents useful analytical and numerical methods of applying fundamental elasticity theories.

Did you know that Kaiser Engineers is noted for widely diversified engineering talents? Departments include civil, structural, electrical, mechanical, architectural, process and production, mining and geology, metallurgical and chemical—all prepared to work closely together on any project. When you have a problem in engineering, call or write Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, Calif.

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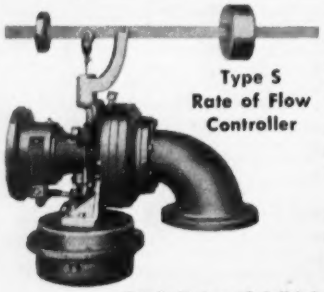

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CONVERTS TO PEA SHOOTER

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INJECTS SOIL STABILIZER

Here's one of the handiest all around tools you can have on the construction job—the Mayo Pneumatic Grouter. Places low on pressure grout in tunnels, mines, shafts, foundations, railroad subgrades, sunken pavements and injects soil stabilizers. Converts easily to pea shooter. No moving parts within the grout. Capacity: 3½ cubic feet. Charging height: 3 ft. Write today for free bulletin 13-A.

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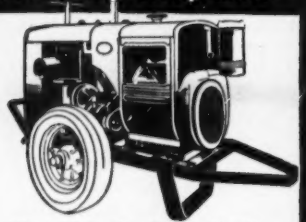
THIS "COMPLETE"

WELLPOINT PUMP

more efficient, more economical, than more costly units



We call it the "Little Giant". Contractors call it a great big boon in a compact package. This little unit, with 6" suction and discharge, handles up to 1200 gpm — may be used for open sump work, for well-pointing and for jetting "Complete" wellpoints (if you're wise) into the ground. Its 1695 pounds are mounted in a 2-wheel chassis that is easily towed behind any vehicle. Sold at a surprisingly reasonable price; Rented if you prefer it that way. Particulars are free. Write today.

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COMPLETE WELLPOINT SYSTEMS

notable in that it will be over water 850 ft deep for 10,000 ft, if one location is selected, or over water 650 ft deep for 8,000 ft in another location. Anchorages for the floating pontoons admittedly will pose a difficult problem in water of such depth, as will protection of the steel anchor lines from the salt water.

Face Andrew with these and other problems, however, and he will still maintain:

"It's not nearly as hard to build a bridge as to get them to let you build it."

Delaware road bureau shifts top personnel

Three of the top personnel of the Delaware State Highway Department moved into new jobs this month, as the department completed a long-planned reorganization program.

R. A. Haber, chief engineer, became engineering consultant.

William A. McWilliams of Dover, formerly director of the Delaware Memorial Bridge, moved up to the post of chief engineer.

Walter B. McKendrick, Jr., Wilmington, was named director of the bridge.

Mr. Haber thus becomes the second engineering consultant in the department's history, has been with the department since 1936, and has been chief engineer since 1951. Mr. McWilliams, who started his service in 1920, served as chief engineer during 1948-49, then became director of the Delaware Crossing Division. •

Illinois highway chief joins railway office

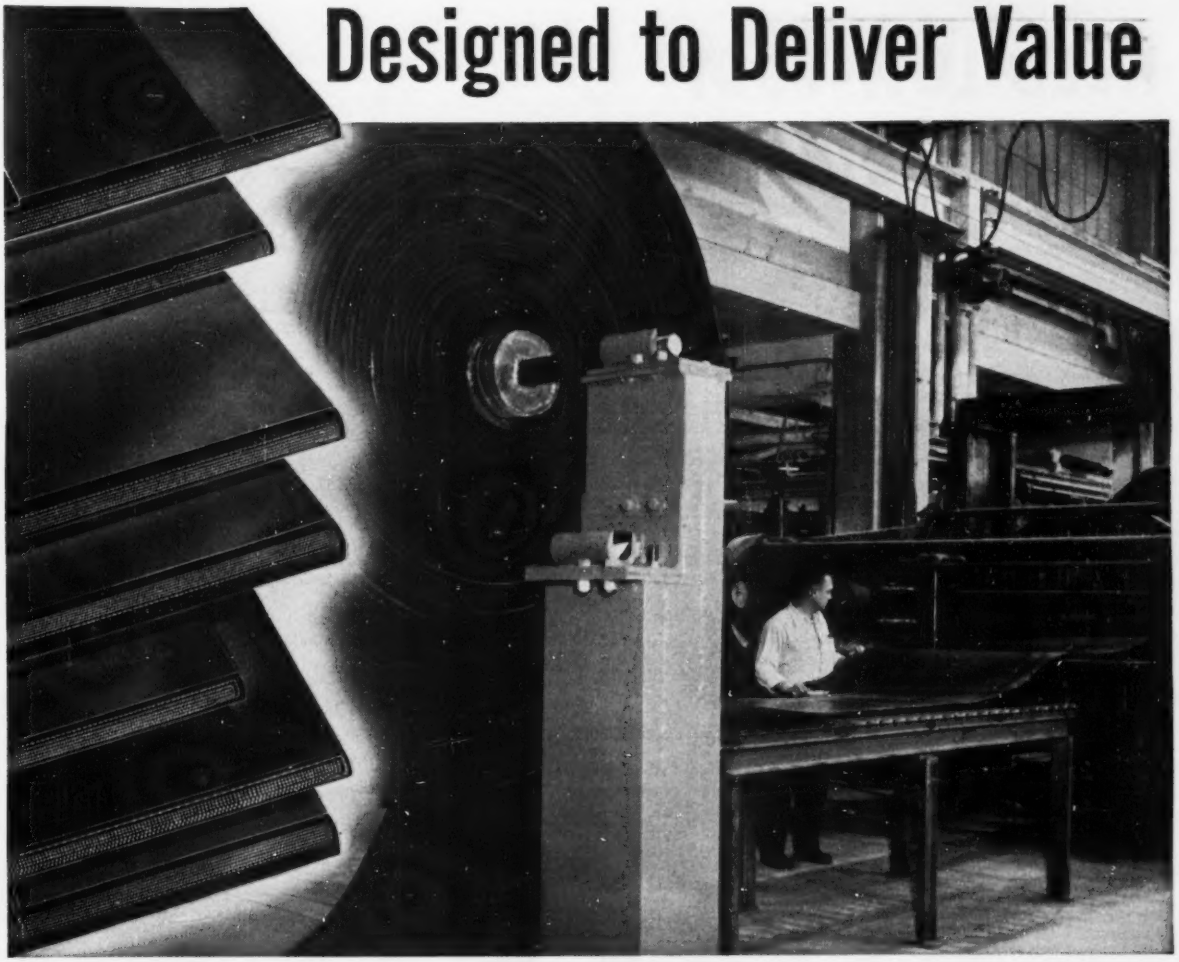
Frank N. Barker, since 1951 chief engineer of the Illinois State Division of Highways, resigned his post August 31 to become assistant chief engineer for the Atchison, Topeka & Santa Fe railroad.

Mr. Barker had been associated with the highways division since 1923, after his graduation from the University of Missouri. One of his principal concerns has been planning studies—in 1936 he was named to head the statewide planning survey, and continued to head this survey and its successor agencies until he was appointed chief engineer.

PCA staff shifts

John F. Hall, district engineer in New York City for the Portland Cement Association, has left PCA to become assistant to the vice-president of

Designed to Deliver Value



Whenever your job requires belting . . . conveyor, elevator or transmission . . . always specify Hewitt-Robins. Hewitt-Robins belting has proved its value through performance on the job. Each Hewitt-Robins belt, available in a complete range of types and sizes, is designed to deliver greater economy and durability for a particular application.

HEWITT-ROBINS CONVEYOR BELTING is job-engineered to handle bulk materials under any conditions.

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For the best answer to your particular belting needs always see your local Hewitt Rubber Distributor. (See "Rubber Products" in your classified phone book.)

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NEED LOW-COST "Mobile" STEAM on the spot?

This Cleaver-Brooks boiler *on wheels* delivers dry steam in 30 minutes or less after arrival

CONTRACTORS who need steam on-the-spot and *in a hurry* depend on Cleaver-Brooks mobile boilers. They know they get plenty of steam the *easy way*. These self-contained boilers can be towed by truck or tractor at a 35-mile clip, job-to-job or moved anywhere on job site. On arrival, one man can hook up water and steam lines . . . start oil burner, and in 30 minutes or less, you're all set with a good "head of steam."

Fully self-contained, with oil and fuel tanks built in, these Cleaver-Brooks mobile boilers require minimum maintenance. They're all-weather protected. No need to bank fires at night for an early start in the morning. Forced draft, four-pass fire tube design, high efficiency oil burner plus completely integrated automatic controls, assure guaranteed 80% efficiency. You get fast steam response for fluctuating demands from full loads down to 30% of rating.

You can use this handy all-year, all-weather boiler for contract or sub-contract jobs. Work like this will keep you busy: Pile driving, extracting, winter concrete thawing, asphalt plant bitumin heating, ready-mix concrete operations, and many other profitable jobs. Available in two sizes — 80 and 125 hp. — trailer or skid mounted for installation on truck or trailer.

See your nearest Cleaver-Brooks Distributor, or write direct for details. Cleaver-Brooks Company, Dept. J, 393 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver-Brooks

Pioneers and Originators of Tank-Car Heaters • Bituminous Boosters "Deuce" • "Peak-Temp"

Ask for bulletin RM-108 which fully describes Cleaver-Brooks Mobile Boilers.

North American Cement Co., New York City.

Mr. Hall will be succeeded by M. J. MacIntosh, who was formerly PCA's regional highway engineer in Pennsylvania, Ohio and West Virginia.

At the same time, it was announced that Charles W. Yoder, formerly district structural engineer for PCA at Milwaukee has left the organization to open his own office at Milwaukee as a structural consulting engineer.

Careers . . .

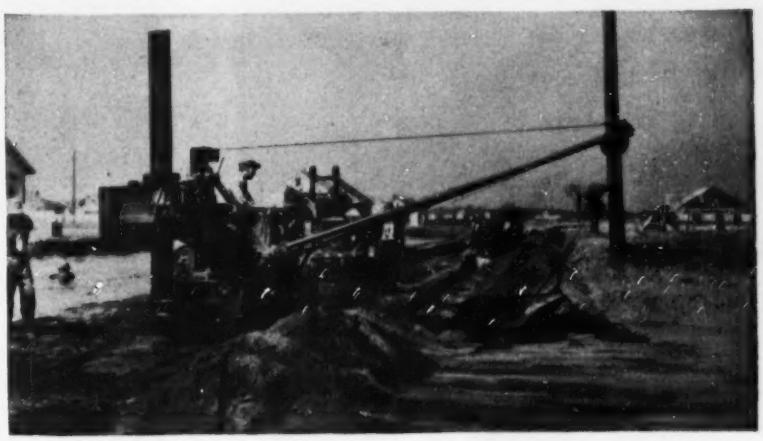
• **Changes**—**Stanley H. Wright,** formerly with the construction engineering division of the Atomic Energy Commission, will be in charge of a new eastern branch office at Washington, D. C., for Holmes & Narver, Los Angeles . . . Alvord, Burdick & Howson, Chicago, have announced admission to partnership of six long-time associates: **Reed I. MacDonald, R. E. Crawford, Edward E. Erickson, P. G. Odgers, George J. Rettig, Arthur W. Houson** . . . **John H. McVey,** district engineer for The Austin Co. in Southern California since 1944, has been named district manager, to succeed **R. E. Ward,** who will continue to serve as a vice-president of the company . . . **W. F. Heffernan** has been appointed sales manager in charge of a new New York sales office for Southwest Welding & Manufacturing Co. . . . **C. B. Smythe,** president of the Thew Shovel Co. since 1945, has been elected to the company's board of directors.

• **Honors**—**Clement J. Freund,** dean of the University of Detroit Engineering College, was honored for 20 years' service to the university and the city by a special Common Council resolution . . . **Col. Paschal N. Strong,** Ohio River Division engineer and an Army career man since his West Point graduation in 1922, has been nominated brigadier general by President Eisenhower . . . **Louis A. Nees,** chief of the engineering branch of the Installations Division of the Air Materiel Command, named for the Arthur A. Wellington prize of the ASCE for his paper on "Pile foundations for large towers on permafrost."

• **Government appointments**—Corps of Engineers: **Col. Lionel R. Ingram,** to be executive officer of the South Pacific Division; **Col. Delbert B. Freeman,** to be division engineer, Upper Mississippi Valley Division . . . **A. L. Elliott** has been named to bridge engineering, planning, **J. E. McMahon** has become bridge engineer, southern area, for the California Division of Highways.

Dig 'em and fill 'em with CLEVELANDS

The Cleveland "Baby Digger" Model 95 is making short work of cutting trench for a gas main extension under good digging conditions in Minneapolis. Even greater savings were effected by the 95 during severe winter digging conditions.



Here, a Cleveland Model 80 is speedily and cleanly backfilling the trench shown in the top picture. The 80 is also an excellent pipe layer. When job conditions require backfill compaction, the 80 does an outstanding job with no additional men or equipment necessary.

The CLEVELAND TRENCHER CO.
Pioneer of the Modern Trencher
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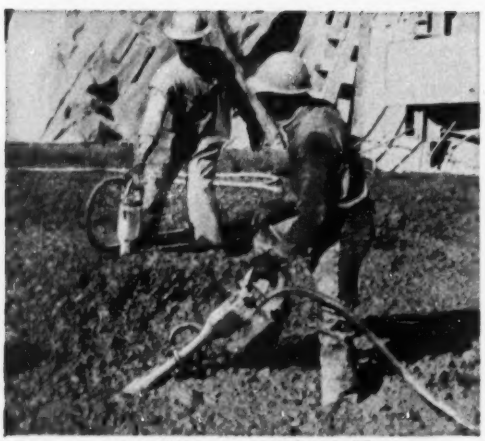
CP Equipment

Makes the

The speed and efficiency in which a construction job is completed depends upon the pace set by the slowest piece of equipment involved. Don't let one piece of "worn-out" machinery cause you costly construction delays. Maybe now is the time for you to review *your* equipment needs. If so, call your nearby CP sales engineer to inform you of the latest product developments. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*



There are seven different models of CP Pneumatic and High Frequency Electric Vibrators — available in one and two man types in frequencies to 10,000 VPM. The pneumatic CP-417 above is ideal for batches up to two cubic yards.

The rugged G-300 Wagon Drill and 70-NDC Drifter powered by the diesel driven CP Portable Air Compressor in the foreground form the perfect team for dependable, low-cost drilling from every angle. The cost-conscious Compressor's gradual speed regulator governs engine speed to conform to drill's air demands. CP Portable Compressors are available in capacities from 60 to 600 cfm. Gasoline or diesel driven.

Chicago Pneumatic

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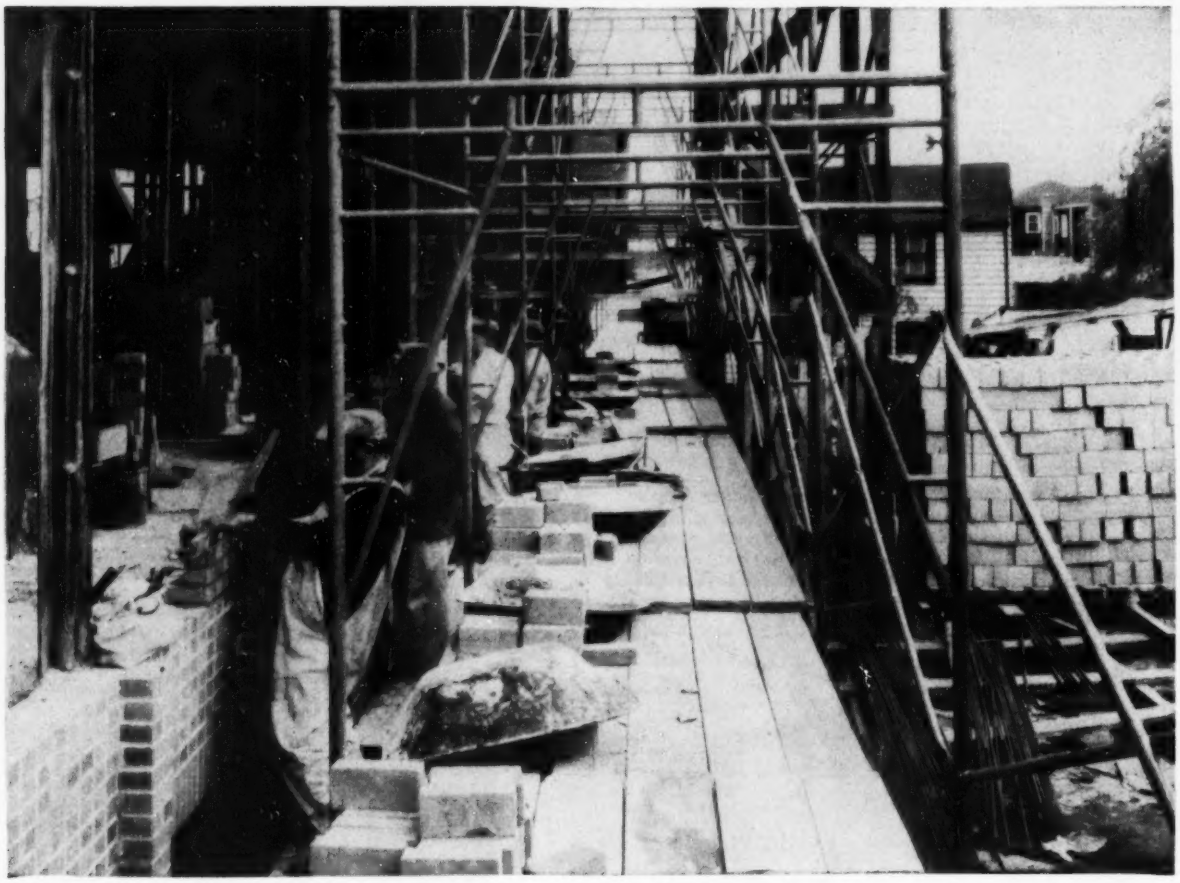
Team!

One man using this "economy-minded" Super Triplex Backfill Tamper can do the work of five men using single tampers — affording better distribution of man power and far less tool investment. It not only saves on air consumption and air hose, but assures higher quality backfill compaction in less time!

"TROUBLE SAVER"® Sectional Scaffolding



SAFE SCAFFOLDING to fit the job is easy with "Trouble Saver" Steel Scaffolding. Safe, positive wing nuts are used to fasten the pivoted double-diagonal braces to prefabricated steel frames. It's reusable on job after job.

This Scaffold Gives Walkroom and Workroom

ON THIS MASONRY JOB it was important to get mortar and brick from the hoist to several masons quick and easy—and, at the same time, not interfere with their work. PS—Patent Scaffolding Co., did it with "Trouble Saver" Sectional Scaffolding, using 6'1" high frames that give plenty of headroom for delivery of materials while providing a 5'-wide platform to hold them.

The masons work on a separate-level 20"-wide platform laid on easily-adjusted sidewall brackets that can be set at varying heights on the "Trouble Saver" Scaffolding frames. This simple and safe method puts the materials in handy reach, and the man at most convenient working level.

It all adds up to saving time and money because "Trouble-Saver" Scaffolding "fits" the job, yet is easy and economical to erect. It's also another example of how PS Co. can solve *any* job problem you have—because PS has *all* types of modern scaffolds.

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PS offers, *nationally*, a complete engineering service available *locally*. See the "yellow pages" of your 'phone book for the nearest PS Co. office or representative handling "Gold Medal" Scaffolds.

FIELD AND OFFICE

Home made plumb board makes a steady plumb line

To ease the difficulty of surveying when layout or reference points are obscured by brush or low mounds, George O. Guesmer, 2822 Golden Valley Rd., Minneapolis 11, Minn., suggests the use of a plumb board. It is pointed out that the board is particularly useful on windy days when it is difficult to hold a plumb bob over the point.

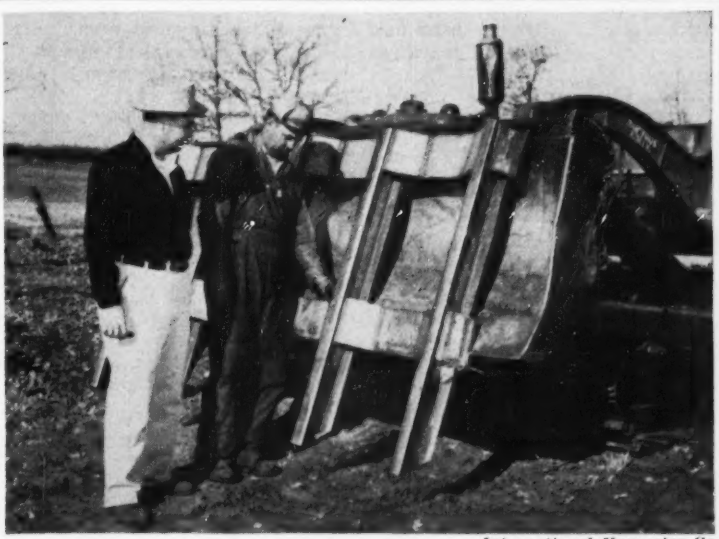
A plumb board may be easily constructed with a three-way plumb and level, plywood, paint and drawing ink. A three-way plumb and level can be obtained from most builders' hardware companies and is generally used to make a carpenter's or mason's level by attaching it to a wooden straightedge.

The board itself is a piece of ¼-in. plywood, 48 in. long and about 3 in. wide, depending on the width of the three-way plumb and level. Three 1-in. holes are bored in the plywood to permit observing of the level bubbles from the rear of the plumb board. The board is painted with a couple of coats of flat white and marked off with black waterproof drawing ink applied with a ruling pen.

The board is ruled down the middle of both sides of the plywood and the ends of the board are graduated laterally in inches or tenths as desired. Alternating black rectangles make the center line easier to see.

To preserve the markings and to keep the board clean it is suggested that the board be finished with clear plastic or spar varnish.

The 48-in. length has been found easy to handle and adequate for most work, but longer boards can be made using the same method.



International Harvester Co.

CLEARING RIGHT-OF-WAY for a 124-mi stretch of power line has been speeded with a brush rake built by J. V. Wilson, Rush Springs, Okla. The rake is made of five reinforced 90-lb rails joined together in parallel. Hinge-connected to the top of a dozer blade and extending 18 in. below the bottom, the rake swings upward when the tractor is reversed, thereby releasing the load. The hinge also permits the device to be mounted or detached in a matter of minutes.

STOP
THAT LEAK FOR GOOD

9 SIKA COMPOUNDS TO END REPAIR PROBLEMS ON CONCRETE AND MASONRY

FOR PRESSURE LEAKS
(SIKA No. 2, SIKA No. 4A) Leaks are easily sealed on the exposed side with quick-setting SIKA mortar. It is not necessary to relieve pressure. SIKA No. 2 is used against heavy pressure or bleeders, SIKA No. 4A against seepage or moderate pressure.

FOR JOINTS OR CRACKS
(IGAS JOINT SEALER, SIKA CAULKING) IGAS JOINT SEALER seals even against pressure and continual movement. Will not sag, crack, dry out, become brittle or lose adhesion. In work above grade SIKA CAULKING is used where highest resistance to atmospheric change is desired.

FOR EXTERIOR REPAIRS
(SIKA-KOTE, SIKA TRANSPARENTS) SIKA-KOTE, a protective and decorative coating in 9 colors and white, prevents moisture penetration on concrete and masonry structures. SIKA TRANSPARENTS render brick structures water-repellent and preserve their appearance.

FOR NON-LEAKING SURFACES
(SIKACRETE, SIKA-KOTE) Water-resistant SIKACRETE mortar is used wherever cement-coat work is indicated. Economical, easy to apply. SIKA-KOTE prevents penetration of ground moisture.

FOR GUNITING OR PRESSURE GROUTING
(SIGUNIT, SIKA No. 4, PLASTIMENT) For quick work against leaks or wet-dry areas, SIGUNIT in mortar prevents washouts. SIKA No. 4 in GROUT-SIKA accelerates set, increases cohesion of mortar and adhesion of grout to rock.

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This 8-page illustrated book discusses the theory and practice of obtaining a good concrete. Beginning with the gel mechanics of cement-water reaction, it describes the factors affecting cement hydration and basic quality of concrete, and how these factors can be controlled to reduce cracking and increase concrete hardness and impermeability.

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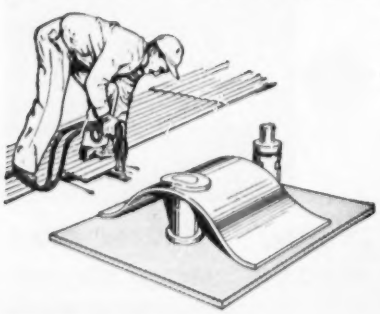

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FINE APPEARANCE GREATER STRENGTH
LOWER INSTALLATION COST

Nelson construction fasteners are distributed by United States Steel Supply Co., Reynolds Metals Co., Aluminum Company of America, Johns-Manville, Philip Carey Mfg. Co., Armstrong Cork Co., Southern States Iron Roofing Co.

NELWELD
NELSON STUD WELDING
DIVISION OF GREGORY INDUSTRIES INC. LORAIN OHIO

RESEARCH

GROWTH RETARDING effect is illustrated by grasses adjacent to guardrail. This area has been mowed only once since application of maleic hydrazide.

Maleic hydrazide applied to grass areas reduces highway maintenance costs

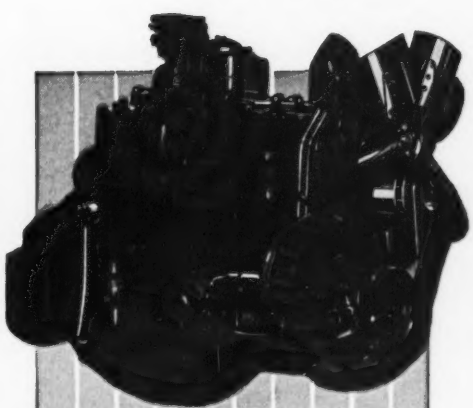
In an attempt to reduce the cost of maintaining the grassy areas along its highways, the Connecticut State Highway Department has been field testing maleic hydrazide, a growth retardant.

Maleic hydrazide, or MH, is a white, crystalline material slightly soluble in water. When applied to grasses, the chemical reacts unfavorably on certain plant growth hormones and thereby hinders further

BEST METHOD of application along roadside and guardrail areas was found to be a single-nozzle fan spray delivering 50 gal per acre at 100 to 150 psi.

Photo courtesy Massey-Harris Co., Ltd., Toronto, Ontario, Canada.

Chrysler powers 70-acre-a-day combine



"'King-size' for today's 'king-size' grain crops" . . . that's one way you might describe this new self-propelled combine shown here hard at work in a wheat field. It has a sixteen-foot, hydraulically controlled auger table and cutting bar which picks up and cuts in any of three widths. Extra-capacity rub bars and straw walkers help assure more complete threshing. Covers plenty of territory with maximum speed of more than fourteen miles per hour, hydraulically controlled through variable speed drive.

To power this combine, Massey-Harris uses the mighty Chrysler Industrial Model 8 Engine with 250 cubic inches displacement. In other Massey-Harris combines the slightly smaller Industrial Model 5 Engine is used. By so doing, this manufacturer makes certain that his combines will give top-notch performance—the kind farmers can depend upon to get in their valuable crops year after year.

Manufacturers select Chrysler Engines *equipped* to meet their needs. For example, they can have engines with standard or gear-driven front ends (with magneto or hydraulic pump drive), twelve or twenty-four volt electrical systems, standard, gyrol Fluid Coupling or torque converter transmissions.

They find too that Chrysler-Industrial Power is not expensive. Production-line methods adapted to specialized industrial engine building provide a custom-built engine at mass-production prices.

See the nearest Chrysler Industrial Engine Dealer or write: *Dept. 78, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.*

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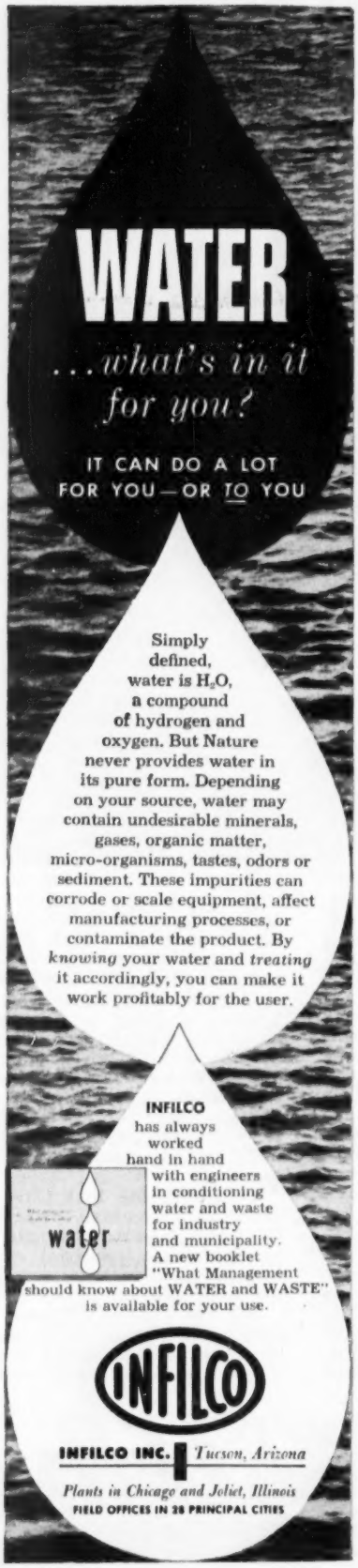
Industrial Engines
HORSEPOWER WITH A PEDIGREE


WATER
...what's in it for you?
IT CAN DO A LOT FOR YOU—OR TO YOU
Simply defined, water is H_2O, a compound of hydrogen and oxygen. But Nature never provides water in its pure form. Depending on your source, water may contain undesirable minerals, gases, organic matter, micro-organisms, tastes, odors or sediment. These impurities can corrode or scale equipment, affect manufacturing processes, or contaminate the product. By *knowing* your water and *treating* it accordingly, you can make it work profitably for the user.
INFILCO has always worked hand in hand with engineers in conditioning water and waste for industry and municipality. A new booklet "What Management should know about WATER and WASTE" is available for your use.
water
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FIELD OFFICES IN 28 PRINCIPAL CITIES

BUMPER MOUNTED ten-nozzle boom was developed for economical center island spraying. 40 gal per acre are applied at 50 psi.

plant growth. The degree of stunting is proportionate to the dosage applied and therefore, can be used to reduce the number of mowings required.

The Connecticut tests were conducted with MH-40, a 40-per cent mixture of MH supplied by the Naugatuck Chemical Division of the U. S. Rubber Co. It was found that MH-40 applied at the rate of 15 lbs per acre along roadside and guardrail areas and 10 lbs per acre on center islands produced a desired growth-inhibiting effect. William C. Greene of the state highway department cited examples in Winsted, Conn., where grass has not been mowed in two years as a result of the application and another area treated last October that has not been mowed since. Other areas have seen the elimination of seventeen mowings.

Excessive dosages of MH can produce browning of the grass or can even be herbicidal. It is therefore necessary to be particularly attentive to methods of application. The Connecticut tryout revealed that the best method along roadside and guardrail areas is with a single-nozzle fan spray operating at 50 to 100 psi and delivering 50 gal per acre. The center island should be sprayed with a ten-nozzle boom delivering 40 gal per acre at 50 psi.

Since MH is absorbed into the plant systems through the leaves, it is desirable to spray the areas when the foliage is dense rather than immediately after cutting. The chemical may be administered at any time of the year, but, if the application is made in the spring, one week should be allowed for the MH to be absorbed and translocated to the roots before mowing.

Under no circumstances should the inhibitor be applied to grasses in poor condition or less than two years old.

According to Mr. Greene the results of the tests have shown that although MH has been only 60 per cent successful to date, the chemical shows definite promise for the purpose intended.

Mobile house laboratory for valley home planning

A mobile house-laboratory will be equipped this summer on the Davis campus of the University of California to find out how to make homes in the Central Valley more comfortable.

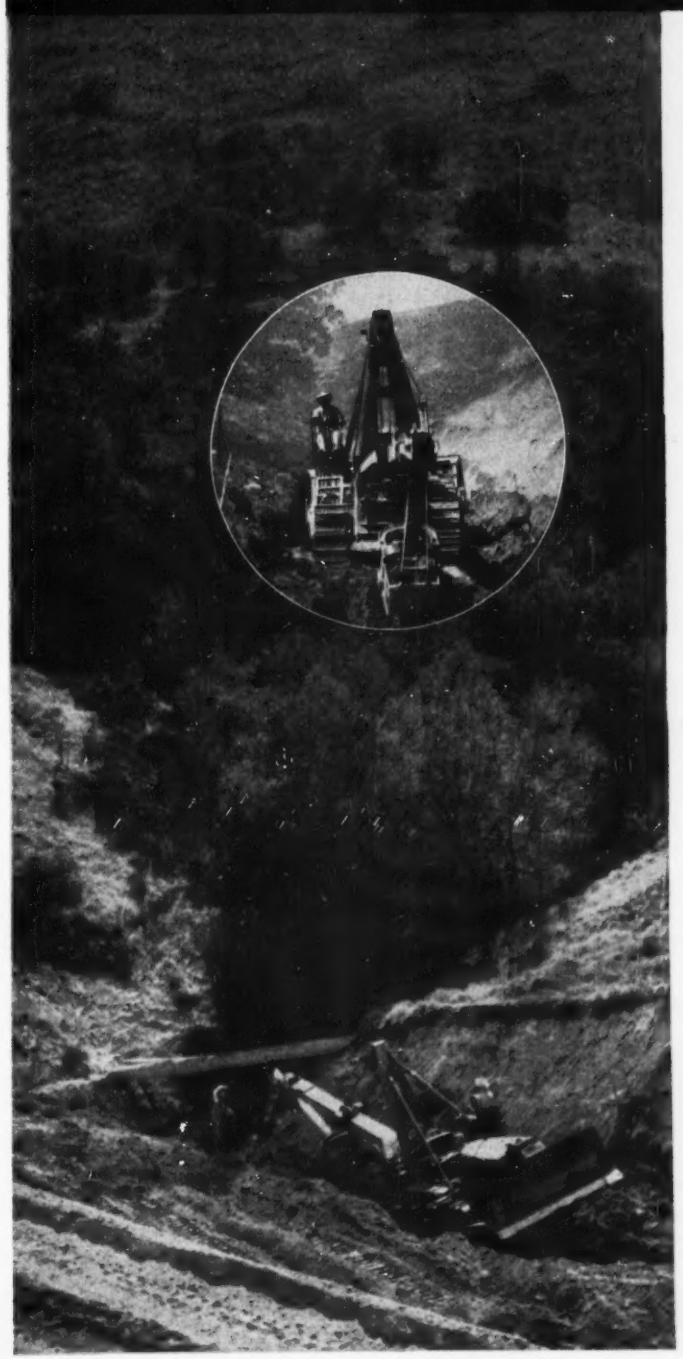
The researchers plan to spot the specially equipped house-trailer under trees, in open fields, along creek beds, on paving, and on grass around the campus and near-by areas to study temperature and humidity changes in and around the mobile laboratory.

Robert B. Deering, chairman of the landscape management department, is resident leader for the joint project, which is being carried on in cooperation with the departments of agricultural engineering and home economics at Davis, and the agricultural extension service.

Thermocouples and other special equipment will record temperature and humidity differences outside the trailer and inside, on the floor, walls, and ceiling.

Home economics staff members will

You Can Dig Anywhere Crawler Tractors Go with HYSTAWAY...



and travel at tractor speed. This means more jobs done, faster, with less equipment.

Only HYSTAWAY has *true* crawler tractor mobility and maneuverability because it mounts on a Caterpillar track-type tractor. Full track oscillation enables the Hystaway to travel over rough terrain without excessive damage to crawler equipment... eliminating the cost and necessity of having expensive standby hauling equipment on hand. Hystaway is the *only* revolving shovel with a complete track-type tractor for its undercarriage! This is the feature that makes the Hystaway the most modern excavator-crane available today.

Other important HYSTAWAY MONEY-MAKING FEATURES INCLUDE: The ability to do excavator-crane work and bulldozing with one piece of equipment; heavy duty diesel tractor engine for power; no tail swing, permitting work in close quarters; mountability on new or used Caterpillar track-type tractors.

And *only* HYSTAWAY combines these *seven* different machines in one!

1. Shovel
2. Backhoe
3. Dragline
4. Clamshell
5. Crane
6. Pile Driver

7. PLUS BULLDOZER!

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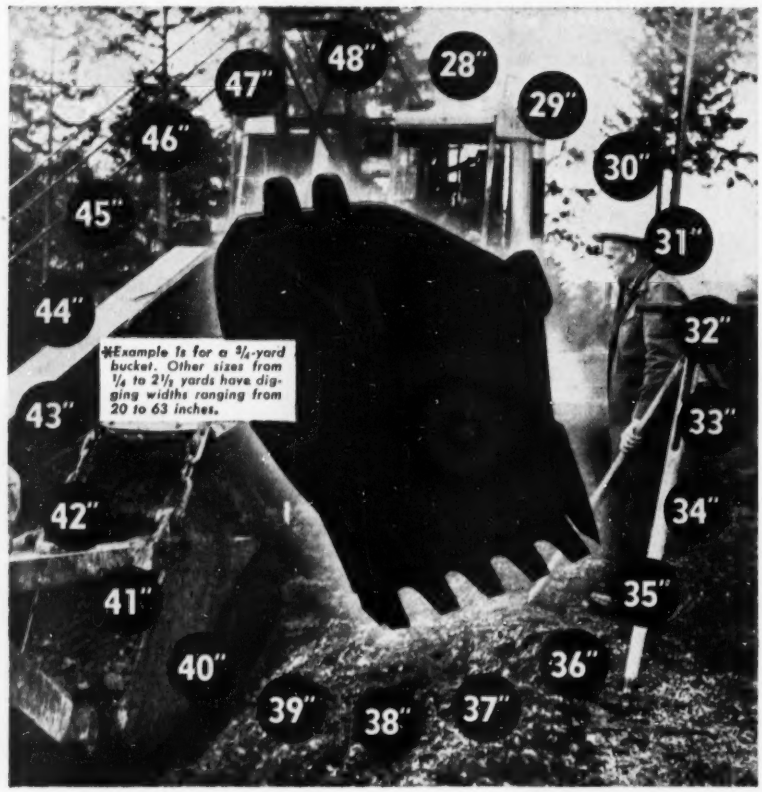
RIGHT to the INCH



ESCO FASTBACK Hoe Dipper Eliminates Unnecessary Digging and Backfilling

The ESCO Fastback hoe dipper digs a trench the width your contract calls for—right to the inch. You don't waste time and money on unnecessary digging and backfilling—and you dig all your trenches with one machine.

*For example, the ¾-yard Fastback dipper is made in three basic widths. By changing side cutters each basic unit gives you seven different widths. Result—*one machine* equipped with three ¾-yard Fastback dippers and side cutters can dig trenches anywhere from 28" to 48" wide—to full ¾-yard capacity—without overload. Other ESCO Fastback hoe dippers give you digging widths from 20 to 63 inches.

Put the money-saving ESCO Fastback to work on your trench digging jobs. Your ESCO representative will be glad to demonstrate, or write for Descriptive Bulletin 189.

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furnish the interior with various types of wall and floor coverings, drapes and shades to see which give best protection against extremes of climate.

After extensive studies with the mobile laboratory, the researchers plan to correlate their findings with houses of various exposures and different types of landscaping in the valley areas.

Effect of incinerator ashes on ground water reported

The sanitary engineering research laboratory, Engineering Center, University of Southern California, has reported the findings of an investigation for the California State Water Pollution Control Board on the effects on ground water quality of soluble salts leached from incinerator ashes.

The sanitary landfill owned and operated by the city of Riverside was used for the investigation.

A summary of conclusions follows:

(1) A sanitary landfill located in intermittent or continuous contact with an aquifer will cause the ground water in the immediate vicinity to become grossly polluted and more than likely unfit for domestic or irrigation use.

(2) Intermittent or continuous contact of the sanitary landfill with ground water resulted in local increase of mineral elements to concentrations varying from 20 times those found in unpolluted ground water up to 10,000 times in the case of some nitrogen compounds.

(3) With respect to cations, it may be expected that a minimum of 1.33 lb sodium and calcium and 1.18 lb of calcium and magnesium will be leached from a cu yd of sanitary fill.

(4) No physical evidence was obtained that would indicate that the sanitary landfill had been penetrated by natural precipitation during its five-year existence.

(5) Ground water that has been polluted by leach from a sanitary landfill may be expected to contain anaerobic bacteria, resulting in a septic condition accompanied by formation of hydrogen sulfide and soluble iron compounds. In the event of subsequent biochemical oxidation nitrogen compounds would be converted to nitrates dangerous to public health.

(6) Compared with the hardness entering the ground water with leach from a sanitary landfill, the additional hardness that might result from the dissolution of calcium carbonate by carbon dioxide produced within the fill is negligible, unless the aquifer is of a calcareous nature.

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The completely new Ford Trucks offer many great advancements in easier driving and time-saving delivery, all at the same low price.

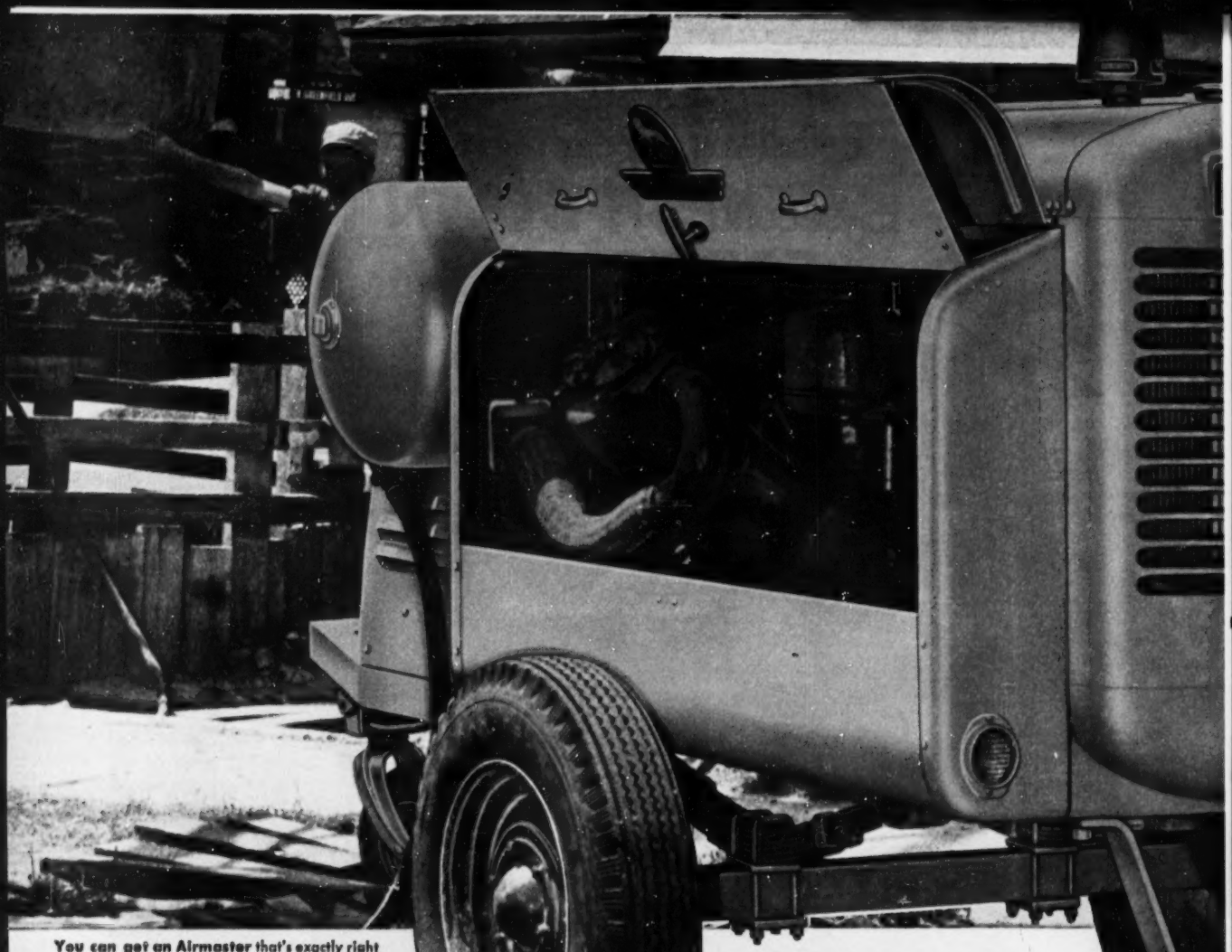
They offer new power for sustained speed travel—new Synchro-Silent transmissions for faster, easier shifting—new setback front axles for sharper turning—new features throughout to help *get jobs done fast.*

Choose the one right truck for your work from over 190 completely new Ford Truck models.

And before you buy any truck, make the *15-second* SIT DOWN TEST. It will open your eyes to comfort you never thought possible in a truck. See your Ford Dealer today!

FORD *ECONOMY* **TRUCKS**

SAVE TIME! SAVE MONEY! LAST LONGER!



You can get an Airmaster that's exactly right for your job. There are 9 sizes—and 14 models — 60 cfm, 85 cfm, 105 cfm, 125 cfm, 185 cfm, 210 cfm, 250 cfm, 365 cfm, 600 cfm, gas and diesel. So you don't have to penalize yourself by working with pressures that are too low — or by operating a machine that's too big and too expensive for the job to be done.

Like the 125-cfm gas unit shown here, every Airmaster is powered by a heavy-duty Le Roi engine designed especially for compressor service.

LeRoi *gives you more for your money!*

MORE AIR POWER! MORE FOOTAGE! MORE PROFITS!

Le Roi-CLEVELAND Paving Breakers are available in sizes from 18 to 80 lbs. They really pack a wallop — make short work of breaking up the hardest concrete. Protective air cushion in front end assures long life. Well balanced for easy handling. Operators like them — and get more done.

Tractair is a combination 35-hp tractor and 105-cfm compressor that takes air power anywhere. Here, it operates a Mobildrill attachment, a lightweight Le Roi-CLEVELAND wagon-drill unit. With other attachments, Tractair can also be used for breaking, tamping, digging, lifting, backfilling, snow-plowing, etc. You save the extra cost of expensive, specialized equipment.

Le Roi-CLEVELAND DR30 Wagon Drill puts deep holes down faster, with less air, than any other wagon drill available. Uses 4" bore Le Roi-CLEVELAND Drifter. Has strong rotation, powerful hole-cleaning ability, and high drilling speed with big bits. For shallow holes, the lightweight Le Roi-CLEVELAND DR34 is available.

To get air power at its best

and air tools with a wallop

. . . team up LeRoi Airmaster Compressors and LeRoi-CLEVELAND Air Tools

Speed your work! Keep costs down!

YOU can't beat Le Roi Airmasters, when it comes to producing *air at low cost!* And you can't beat Le Roi-CLEVELAND Air Tools, when it comes to knocking out *extra footage!* Together, they're a thrifty team that stays on the job, hard at work, day in and day out—costs you less to own —increases your production per man-hour.

When it comes to selecting an Airmaster, you can match your job requirements exactly with the size that lets you do the most work at the least cost. That's because Le Roi's expanded Airmaster line gives you the industry's widest range of portable compressors to choose from.

Every model, every size provides these well-known Airmaster advantages: Full-pressure system that delivers *all* the air you call for, *when* you call for it. Conservative rating that provides ample power reserve — for lower fuel consumption, less maintenance, lower operating costs. Magneto ignition that gives you quick, easy starting — saves time — lets you get going faster.

You make the most of Airmaster performance, when you use Le Roi-CLEVELAND Air Tools. Their exclusive valve action assures low air consumption, high air pressure at the tools. They really stand up, too — break more pavement, dig more clay, drill more rock, tamp more fill.

Put this combination to work on your next project — and hold costs down. See your Le Roi distributor. Write for latest bulletins.

Le Roi-CLEVELAND Sinkers are available in sizes from 18 to 80 lbs., with performance advantages you want. They use less air. They're easy to handle — operators don't tire as easily. And Le Roi-CLEVELAND Sinkers have what it takes to drill more feet per shift: Strong rotation. Powerful blow. High drilling speed.

Compressors
Rock Drills
Tractair
Engines . . .

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

Mass., **Worcester**—B.A. 8/27—City, Dpt. P. Wks., 20 E. Worcester St., Contr. No. 5 sewage overflow regulators. $325,000. Extended date. Camp, Dresser & McKee, 6 Beacon St., Boston, engrs. CD 8/5.

Mass., **Boston**—B.A. 9/3—State, Metropolitan Dist. Comn., Sewage Div., 20 Somerset St., furnish, install sewage pumping equip., pumping station, Alford St., Contr. 160, Charlestown. $180,000. Plans deposit $10, refundable. CD 10/24.

▲† **Mass., Chicopee Falls**—RUNWAYS, etc.—B.A. 9/11—U. S. Eng., 857 Commonwealth Ave., Boston, runways, taxiways, aircraft fueling sys., Westover Air Force Base, Eng-19-016-54-22. $5,000,000. Plans deposit $100, refundable. Duffill Assoc., Inc., 80 Boylston St., Boston, archt. CD 7/28.

BIDS ASKED—BUILDINGS

Conn., **New Milford**—SCHOOL—B.A. 8/25—Town, Bd. Educ., Town Hall, elementary school, Pickett District Site. $860,000. Plans deposit $50. CD 7/20.

Mass., **Westford**—SCHOOL—B.A. 8/28—Town, School Bldg. Comn., E. M. Abbott, chn., Westford Academy Bldg., high school. $700,000. Plans deposit $50, refundable. Irving W. Hersey & Assoc., Dover Rd., Durham, N. H., archts. CD 6/10.

Conn., **Woodbury**—SCHOOL—B.A. 8/31—Town High School Bldg. Comn., Woodbury, high school. $400,000. Plans deposit $25. E. M. Foote, Jr. & R. C. Dreyer, 420 Madison Ave., New York, N. Y., archts. CD 11/13.

Mass., **Lynn**—SCHOOL—B.A. 9/2—City, Lynn, J. W. McDonald, supt. Bldg. Dpt., City Hall, brick, masonry Shoemaker School addn. $300,000. Plans deposit $75. Melvin F. Coombs, 56 Central Ave., archt. CD 3/13.

▲ **Mass., Sturbridge**—SCHOOL—B.A. 9/3—Towns Sturbridge, Brookfield, Brimfield, Wales and Holland, School Bldg. Comn., Sturbridge, Tantasqua Regional District School, Brimfield Rd. $1,000,000. Anderson-Nichols & Co., 150 Causeway St., Boston, engrs.-archts. CD 6/30/52.

Conn., **Hartford**—SCHOOL—B.A. 9/10—City, 550 Main St., Clarence Barbour Elementary School addn., Tower Ave. $500,000. Plans deposit $50. Malcolm R. Knox, 86 Farmington Ave., archt. CD 6/17.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MAINE—State Hy. Comn., State House, Augusta,
Lane Constr. Corp., 37 Colony St., Meriden, Conn. CA. $75,750. b. conc. surf. 4 mi. Maintenance Proj. 982X, Glenburn-Bangor;
Frank Rossi, RFD 5A, Gardiner, Me. CA. $424,072. bit. macad. 6.742 mi. F.A. Proj. F 08-1 (2), Lebanon. Bids Aug. 5. CD 7/30.
▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Bayer & Mingolla Constr. Co., Park Ave., Worcester, Mass. LB. $385,986, est. $500,000. constr. Rte. 127, Bolton;
Stoughton Crushed Stone Co., 1101 Turnpike St., Stoughton, Mass. LB. $97,099, est. $105,000. constr. Belmont St., Rte. 123, Brockton and Easton; LB. $91,225, est. $90,000. resurf. Auto Rte. 28, Falmouth;
Daniel O'Connell Sons, Inc., 40 Hampden St., Holyoke, Mass. LB. $798,749, est. $810,000. hy. and bridge constr., West Springfield. Bids Aug. 4. CD 7/23 and 7/21.
MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Coleman Bros. Corp., 40 Central St., Boston, Mass. CA. $747,734, est. $720,000. state hy. and bridge reconstr. Hunt's Falls Bridge, Lowell. Bids July 21, awarded Aug. 6. CD 7/27, under LB.
CONNECTICUT—State Hy. Comn., State Office Bldg., Hartford,
Brunelli Constr. Co., Inc., 19 Main St., Southington, Conn., LB. $387,289, grading Hartford-Springfield Expressway, Fed. Aid Proj. FI-139 (9), Windsor. Bids Aug. 3. CD 7/20.

BUILDINGS

LOW BIDS AND CONTRACTS

Walsh Brothers, 150 Hampshire St., Cambridge, Mass., CA. $500,000, CHURCH, MANCHESTER, N. H. St. George's Church, R. C. Diocese of Manchester, Rt. Rev. Matthew E. Brady, Bishop, 51 Walnut St., Manchester, N. H. Bids July 2. CD 6/24.
D. A. Sullivan & Sons, Inc., 82-84 North St., Northampton, Mass. LB. $423,787, est. $400,000. No. 12, Women's DORMITORY, AMHERST, MASS. University of Mass., Alumni Bldg. Assoc., A. C. Brett, pres., Amherst, Mass. Bids Aug. 4. CD 7/23.
Jefferson Constr. Co., 75 First St., Cambridge, Mass. CA. $691,198, est. $500,000. ARMORY addn., alterations, 925 Commonwealth Ave., BOSTON, MASS. Commonwealth of Mass., Armory Comn., 905 Commonwealth Ave., Boston, Mass. CD 7/31, under LB.
J. J. Powers Co., 238 Main St., Cambridge, Mass. CA. Est. $500,000. Y.W.C.A. BLDG., Temple St., CAMBRIDGE, MASS. Young Women's Christian Assn., 140 Clarendon St., Boston, Mass. Bids June 24. CD 6/10.
Vara Constr., Inc., 718 Huntington Ave., Boston, Mass. LB. $809,000. elementary SCHOOL Chelmsford Center, CHELMSFORD, MASS. Town, School Dpt., 50 Billerica St., Chelmsford, Mass. Bids Aug. 4. CD 7/17.
▲ **Joseph Rugo, Inc.**, 581 Boylston St., Boston, Mass. CA. $2,018,238. est. $2,400,000. medical INFIRMARY BLDG. P-M-18, State Hospital, DANVERS, MASS. State, Dpt. Mental Health, 15 Ashburton Pl., Boston, Mass. CD 7/7, under LB.
John Capobianco, 44 School St., Boston, Mass. LB. $535,000. BANK, Essex and Lawrence Sts., LAWRENCE, MASS. Essex Savings Bank, 296 Essex St., Lawrence, Mass. Bids Aug. 3. CD 7/15.
† **Ernest F. Carlson, Inc.**, 1694 Main St., Springfield, Mass. CA. $495,350. general purpose WAREHOUSE addn., Springfield Armory, ENG-016-53-65, SPRINGFIELD, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 3/18, under LB.
P. Francini & Co., Inc., 7 Francis St., Derby, Conn., CA, $565,462, est. $550,000 Northwest SCHOOL, Sheppard Ave., HAMDEN, CONN. Bd. Educ., F. A. Beecher, 2040 Dixwell Ave., Hamden, Conn. Bids July 31, awarded Aug. 6. CD 8/7, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **Md., Annapolis**—OIL STORAGE FACILITIES—B.A. 8/25—P. Wks. Office, U. S. Naval Academy, Annapolis, rehabilitation, relocation of oil storage facilities, U. S. Naval Engineering Experiment Station, NOY 79357, Spec. 39715. Plans deposit $15. CD 11/17/47, under Public Buildings.

BIDS ASKED—BUILDINGS

▲ **Pa., Phila.**—SCHOOL IMPRVS.—B.A. 8/25—Bd. Educ., 21 and Winter Sts., test borings for South Philadelphia High School. Total est. $5,000,000. Gravell & Duncan, 1600 Walnut St., consult. engrs. Davis, Dunlap & Carver, 717 Samsom St., Phila., archts. CD 9/18.
▲ **N. Y., Woodmere**—SCHOOL—B.A. 8/27—Bd. Educ., Union Free School District 15, Mrs. Helen McGinnis, clk., Lawrence, superstructure for Grade School 6. $2,400,000. Extended date. CD 5/21.
Pa., Phila.—SCHOOL—B.A. 9/1—Bd. Educ., 21 and Winter Sts., East Falls Elementary School. $750,000. Oscar Stonorov, 1621 Chestnut St., archt. CD 10/22/51.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
B.A.	**Bids Asked**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

▲ **N. J., Ridgewood**—SCHOOL—B.A. 9/23—Bd. Educ., F. J. Byrnes, clk., Administration Bldg., Junior High School. $1,550,000.
Pa., Phila.—OFFICE—Bids Asked—J. Bedford Wooley, archt., 1935 Chestnut St., office, warehouse and store, 5000 Ridge Ave., for M. Buten & Sons, 1834 South St. $500,000. Revised plans. CD 11/6.

SOON LETS CONTRACT—BUILDINGS

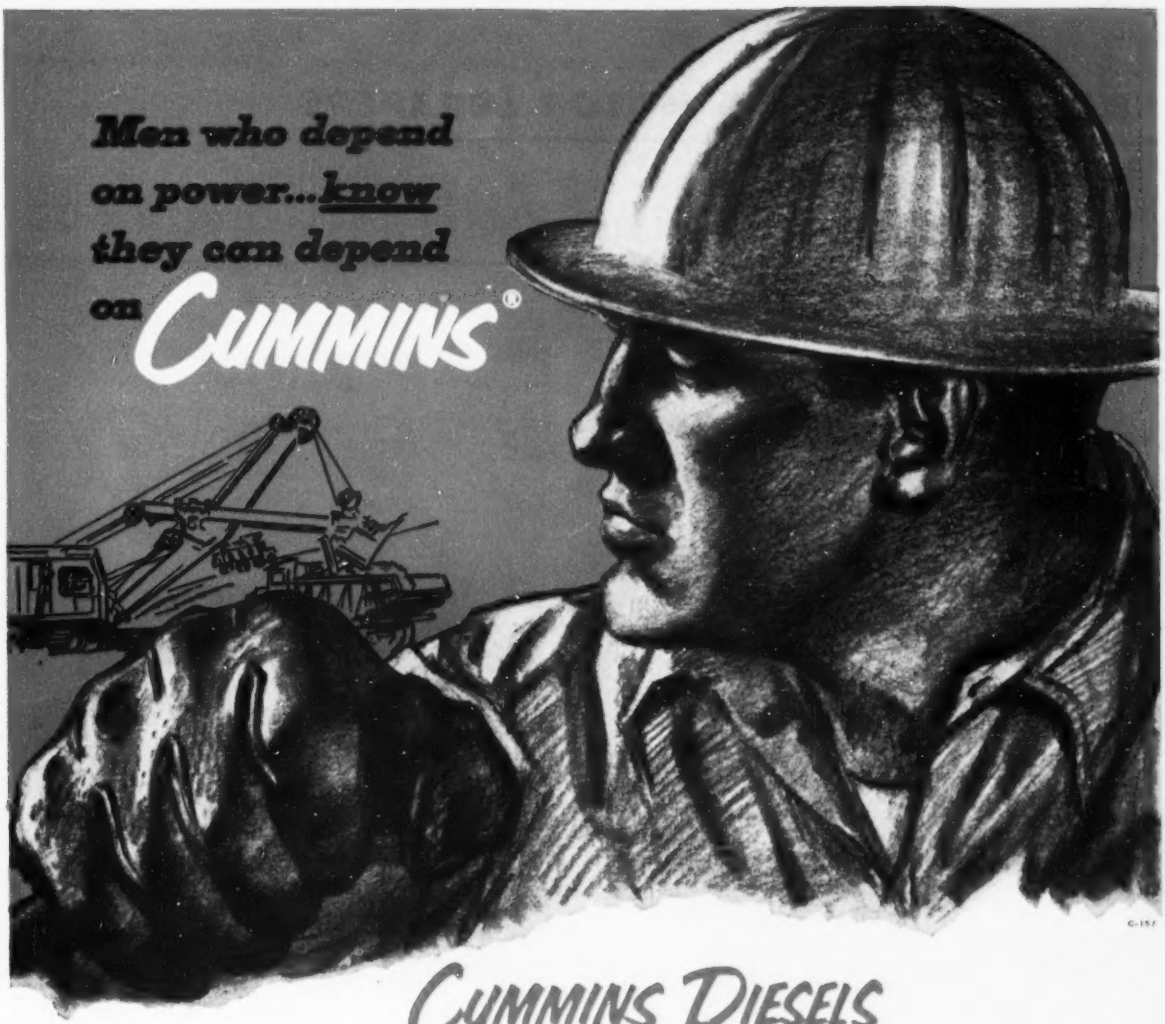
Del., Wilmington—STORE—Massena & Dupont, archts., 704 Delaware Ave., soon lets contract retail store addn., for John Wanamaker, 13 and Market Sts., Phila., Pa. $500,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
John Arborio, Inc., W. Cedar St., Poughkeepsie, N. Y. and **Corbetta Constr. Co., Inc.**, 220 E. 42 St., New York, N. Y., LB, $11,487,198, est. $11,597,000. c. conc. 13.03 mi.; b. conc. Type 1A, opt. 0.31 mi.; T. C. graded grav., D. S. T. 2.26 mi; 5 H.G.S. comp. I-beams 276.3 ft.; 197.7 ft., 198 ft., 304 ft. and 199.5 ft., 1 H.G.S. welded girder and comp. I-beams 75.9 ft., 2 bridge plate girder comp. I-beam cantilever 540 and 356 ft., New York State Thruway-Catskill Sec.-Sub. 4 (New Paltz-Whiteport); Rte. 299 Interchange; Highland-New Paltz H-1536: Kingston High Falls SH229; eight town or country roads, Contr. CT 53-10, S. T. 53-26, RC 5-103, Ulster Co. Bids Aug. 6. CD 7/15.
▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1,
Merritt-Chapman & Scott Corp., 260 Madison Ave., New York, 16, N. Y., LB, $2,470,724, est. $2,473,000 1.34 mi. New York State Thruway-Hudson Section Sub. 9B Tappan Zee Bridge, HT 53-6, Westchester and Rockland Counties. Bids Aug. 6. CD 7/15.
NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1.
The Brunalli Constr. Co., Southington, Conn., LB, $722,699, est. $743,000, elimination of N.Y.C. R.R. with Lemoyne Ave. and Lemoyne Ave. S.H. 49-12, 0.47 mi. PSC 15302, Onondaga Co. Bids Aug. 6. CD 7/15.
▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Laurence J. Rice Inc., 30 Deepdene Rd., Forest Hills, 75, N. Y., CA, $1,650,419, 0.44 mi. Major Deegan Expressway Cont. 7B, FA. MDE 53-5, Bronx Co. Bids June 25. CD 6/29, under LB.
▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1,
Bero Eng. & Constr. Corp., McKinley Bldg., Buffalo, 2, N. Y. LB, $1,745,766, est. $1,780,000, 13.91 mi. Lafayette-Onativia Rd., S.H. 9086, Lafayette-Pompey Pts. 1 & 2, S.H. 8332; Pompey-Cazenovia Pts. 1 & 2, S.H. 8391, Syracuse Turnpike Pt. 1, S.H. 9023, FARC-53-94, Onondaga and Madison Counties;
Lancaster Dev. Inc., Dunkirk, N. Y., LB, $469,137, est. $481,000, 1.13 mi. Penn State Line-Dunkirk, Pt. 2, S.H. 8334; Dunkirk-Silver Creek, SH 8304; FARC 53-102, Chautauqua Co.;
Theodore Zoli Constr. Co., Inc., Torrington, Conn., LB, $194,631, 1.88 mi. Ausable Forks-Clintonville, S.H. 476, FARC. 53-101, Clinton Co.;
D. A. Collins Eng. & Constr. Co., N. Main St., Mechanicville, N. Y., LB, $306,183, est. $322,000. 0.5 mi. City of Mechanicville, Central Ave., FA. C. 53-15, Saratoga Co.;
Horn Constr. Co., Inc., N. Hewlet Ave., Merrick, N. Y., LB, $673,041, est. $853,000. 0.66 mi. railroad, 0.21 mi. hy. Peninsula Blvd., FASG. 53-6, Nassau Co.;
Kendall Roadways, Inc., 1373 William St., Buffalo, 6, N. Y., LB, $418,519, est. $450,000. 3.81 mi. Hamburg-Springville, Pt. 1, S.H. 527, FARC 53-89, Erie Co.;
Binghamton Constr. Co., Inc., Marine Midland Bldg., Binghamton, N. Y., LB, $281,500, est. $315,000. 3.32 mi. Lisle-Center Lisle SH. 455, Lisle Village, Main St., SH. 1608, FARC, 53-90, Broome Co.;
County Asphalt, Inc., 129 Main St., Tarrytown, N. Y. LB, $193,563, est. $230,000. 3.34 mi. Bainbridge-Unadilla, Pts. 1 and 2, SH. 5013-5216, Robbins Crossing-SH 5454, FARC. 53-98, Chenango Co.;
received no bids Aug. 6, 10.66 mi. Speculator-Indian Lake Part 1, FASSH. 53-11, Hamilton Co., est. $1,720,000. CD 7/15.
D. Palombo Sons, Inc., 1600 Washington Rd., Pittsburgh, Pa. LB, $76,304, Contr. 20, water mains N. Transit Rd., Corinthia, Hawley and West Jackson Sts., LOCKPORT, N. Y. Mayor and Common Council, City Hall, Lockport, N. Y. Bids July 27. Low bidder has requested that bid be withdrawn. CD 7/8.
▲ **Frank Mascali & Sons, Inc.**, 120 St. and 31 Ave., Flushing, N. Y., CA, $1,590,011, vehicular overpass, incl. grading, utilities, paving, landscaping Franklin

(Continued on page 126)



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Export: Cummins Diesel Export Corporation
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FULL CONTROL makes

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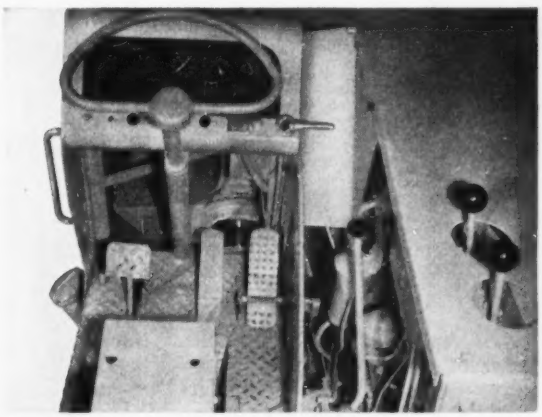
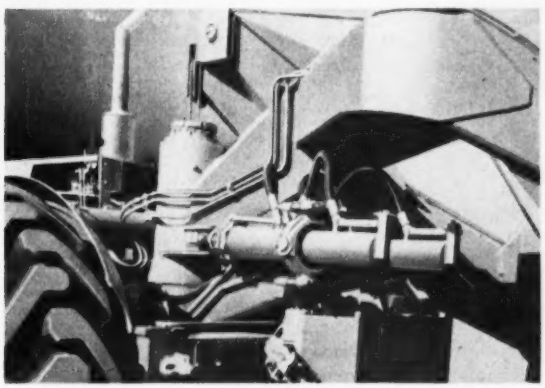
14 cu. yd. struck capacity
18 cu. yd. heaped capacity
280 hp. Buda diesel or
275 hp. Cummins diesel

the difference

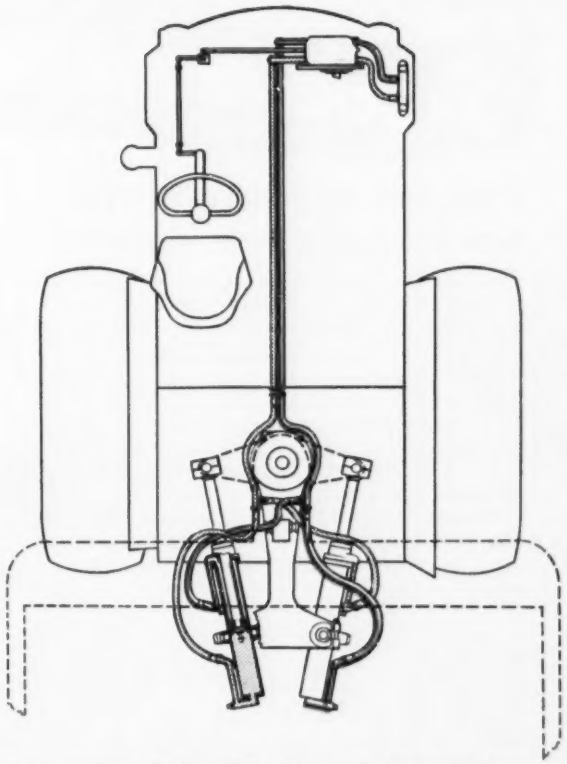
The full control built into Allis-Chalmers *Motor Scrapers* offers you a real advantage. There's no tiring wheel fight for the operator . . . no straining to see what he's doing. What's more, full control creates greater confidence when he's high-balling a full load. He can work at his best all day long easily and safely. To you owners, that means moving *more* dirt *faster*, more *profitably*.



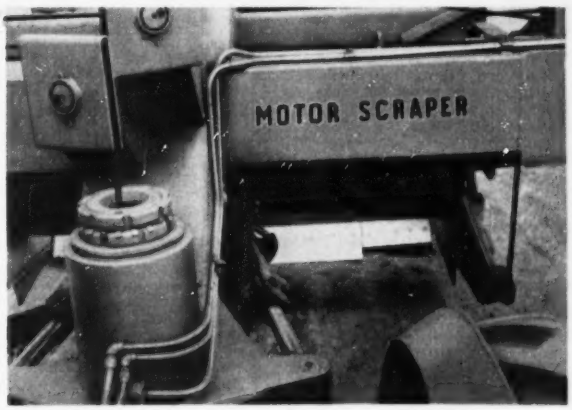
One Hand Does the Steering—the other handles the scraper controls. Fast action makes loading easy. The operator can utilize hydraulic power of steering jacks to pull through soft spots in haulways under extreme conditions.



No Weaving—No Road Shock — Hydraulic system is locked and the *Motor Scraper* becomes a rigid 4-wheel unit except when steering wheel is turned, thus eliminating transmission of road shock to steering wheel. Low-mounted rams, close to load line pull, mean minimum stress on the kingpin.



Easy, Fast-Action Steering — Schematic layout shows simple double-action steering system. Slightest movement of wheel opens valve of gear-type pump; release wheel and valve automatically returns to "hold." Only a one-third turn of steering wheel is necessary for a full swing of the tractor.



Excellent Operator Visibility — Clean design of low gooseneck connection gives operator unequalled view of cutting edge, helps him cut cleanly, efficiently . . . load fast and full.

Your nearby Allis-Chalmers dealer will be glad to show you and give you the full story on these job-proved *Motor Scrapers*. See them at work.

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Perlite Products Corp., Dallas, Texas — William J. McCormack Sand Co., Inc., New York, New York — Aerlite Processing Corp. of Fla., Vero Beach, Fla. — MacArthur Company, St. Paul 4, Minn. — Perma Rock Products, Inc., Baltimore 30, Maryland — The Whittemore Company, Redondale 31, Mass.

Baltimore Perlite Products, Rapid City, South Dakota — Pennsylvania Perlite Corp., Allentown, Pennsylvania — New Jersey Perlite Corp., Newark, New Jersey — McClure & Erickson Corp., Los Angeles, California — West Indies Perlite Mfg. Co., Inc., Havana, Cuba — Virginia Perlite Corp., Hopewell, Virginia

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(Continued from page 122)

D. Roosevelt Rd. between 92 and 99 Sts., Manhattan Boro, Contr. No. 96A, NEW YORK, N. Y. Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, 35, N. Y. Bids July 22. CD 7/24, under LB.

† **Five Boro Constr. Co.,** 2 Lafayette St., New York, N. Y. CA, **$623,994,** rehabilitation existing facilities, Niagara Falls Air Force Base, NIAGARA FALLS, N. Y. U. S. Eng., 80 Lafayette St. New York, 13, N. Y. CD 10/16.

Nesto Constr. Co., 100 Riverside Ave., Newark, N. J. CA, **$152,149,** imprv. Roosevelt Ave. from E. Front St. to E. Fifth St., Local Imprvt. Ordinance No. 348-B, PLAINFIELD, N. J. City, City Hall, Plainfield, N. Y. Bids July 6. CD 6/18.

Plattsburgh Housing Auth., 27 Broad St., Plattsburgh, N. Y. received no bids Aug. 3, Contr. 5, lawns and planting for John J. Collins Park Proj. NY 18-1, PLATTSBURGH, N. Y. Will re-advertise. CD 7/16.

▲ **PENNSYLVANIA**—Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg,

C. J. Langenfelder & Son, Inc., 8427 Pulaski Hy., Baltimore, Md. CA **$4,139,090.** grading, drainage, and structures 3.5 mi., Sec. 34-C Delaware River Extension Bucks Co. CD 7/10, under LB.

▲ **PENNSYLVANIA**—State Hy. & Bridge Auth., 506 N. Office Bldg., Harrisburg,

Harry C. Erb, Inc., 29 Bala Ave., Bala Cynwyd, Pa. CA **$2,043,015.** constr. 18,137 ft. divided hy. of rein.-cement pavement 24 ft. wide each side of divisor; crushed aggregate base, one I-beam and 2 rein.-con. bridges T.R. U.S. 1; 13, Falls Twp., Bucks Co. Bids July 24, awarded Aug. 6. CD 7/30, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Ryan Bros., Inc., Clearfield, Pa., LB, **$1,816,796,** 38,157 ft. c. conc., 3 I-beam bridges, T.R. 11-92, Tunkhannock and Clinton Twps., Wyoming Co.;

James D. Morrissey, Inc., 9119 Frankford Ave., Phila., 14, Pa., LB, **$91,205,** 2,013 ft. crushed aggregate base road w/bit. L.R. 09157 (2) Falls Twp., Bucks Co.;

Paul Kebert, R.D. 6, Meadville, Pa., LB, **$134,089,** wid'n. 15,157 ft. road with gran. slag base and bit. T.R. 322, West Mead Twp., Crawford Co.;

A. J. Marsolino, 10 N. Mt. Vernon Ave., Uniontown, Pa., LB, **$60,066,** 2,039 ft. crushed aggregate base w/bit. L.R. 247, Washington Twp., Fayette Co.;

James J. Skelly, Inc., State and Balto Ave., Media, Pa., LB, **$94,668,** 3,799 ft. crushed aggregate base w/bit. L.R. 46197 (1), Montgomery Co. Bids Aug. 7. CD 7/16.

▲ **Nello L. Teer Co.,** Trust Bldg., Durham, N. C. CA **$6,682,570.** est. $5,000,000. flood control dam and reservoir on First Fork of Sinnemahoning Creek, Cameron and Potter Counties, PENNSYLVANIA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids July 29, awarded Aug. 5. CD 8/3 under LB.

▲ **Hughes Foulkrod Co.,** Schaff Bldg., Phila., Pa., CA, **$1,043,657,** sewage disposal project Island Ave. between Delaware River and Southwest Sewage Treatment Works, PHILA., PA. Dpt. Procurement Dpt., City Hall Annex, Phila., Pa. CD 9/11/46.

Union Paving Co., 1227 N. Broad St., Phila., Pa., CA **$748,915,** paving terminal loading apron, International Airport, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. CD 7/15, under LB.

DELAWARE—State Hy. Dpt. Dover,

H. C. Eastburn & Son, Inc., Newark, Del., LB, **$94,323** 2.014 mi. Kennett Pike (Greenville to Wilmington) New Castle Co., Contract 1271. Bids July 29. CD 7/20.

James Julian, Inc., 405 S. DuPont Rd., Elsmere, Del., CA, **$136,533,** constr. South Delaware Interceptor Sect. 4, between Wilmington Manor Gardens and New Castle, New Castle Co., WILMINGTON, DEL. New Castle Co. Levy Court, Public Bldg., 11 and King Sts., Wilmington, Del. Bids Aug. 4. CD 7/22.

BUILDINGS

LOW BIDS AND CONTRACTS

The DeLuca Constr. Co., 27 Crescent St., Glenbrook, Conn., CA, **$384,188,** general contract Central SCHOOL, DUANESBURG, N. Y. Duanesburg-Delanson Centarl High School Dist., Duanesburg, N. Y. Bids June 30, awarded July 28. CD 6/25.

Planet Constr. Co., 11 W. 42 St., New York, N. Y., LB, **$847,000,** Westchester Square HEALTH CENTER and Westchester Square Branch LIBRARY, Glebe Ave. and Overing St., Bronx Boro, NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg., New York, 7, N. Y. Bids Aug. 5. CD 7/13.

Pigeon Hole Constr. Co., Inc., Peyton Bldg., Spokane, Wash., CA, **$300,000,** design and construct 5 story, 60x200 ft. automatic parking GARAGE, 3 Ave. between East 45 and 46 Sts., NEW YORK, N. Y. 720 Third Avenue Corp., c/o General Realty & Utilities Co., 285 Madison Ave., New York, N. Y.

▲ **John A. Johnson & Sons, Inc.,** 303 41 St., Brooklyn, 32, N. Y., CA, **$2,183,000** Base Bid 1, general contract Syracuse HOUSING Proj. NY-1-2, bounded by Otisco, Wyoming, Fabius, Tioga, Tully and Oswego Sts., SYRACUSE, N. Y. Syracuse Housing Auth., 301 E. Washington St., Syracuse, 2, N. Y. Bids June 16. CD 6/30, under LB.

Zwigard Constr. Co., 239 Millburn Ave., Millburn, N. J. CA, **$300,818,** general construction Elementary SCHOOL, Killian Pl., UNION, N. J. Bd. Educ., Union, N. J. Bids July 30. CD 7/9.

William Graham, Chalfont, Pa., CA, **$642,000,** RESIDENTIAL DEVELOPMENT, Braewood Tract, DOYLESTOWN, PA. Braewood Development Corp., Buckingham Valley, Pa. J. C. Parks & Assocs., Newtown, Pa., engrs.

Altman Builders Corp., Bala Cynwyd, Pa. Separate Contracts. **$700,000.** RESIDENTIAL DEVELOP-

(Continued on page 128)

Hypoid Gearing

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Truckers today are getting more miles per truck, under tougher operating conditions, than ever before. Such major improvements as Hypoid gearing, developed and built by TDA, are increasing truck life and reducing maintenance in spite of the heavy schedules of a defense economy.

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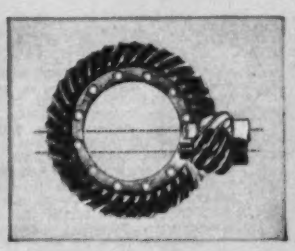

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(Continued from page 126)

MENT, Whitmarsh Rd., HAVERTOWN, PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

Graziano Constr. Co., Inc., 826 N. Highland Ave., Pittsburgh, Pa. CA **$927,000.** general contract Junior-Senior High SCHOOL for Jefferson-Morgan Joint School Dist., JEFFERSON, PA. State Pub. School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. CD 7/16, under LB.

State School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa., rejected bids July 9, alterations, addns. to SECONDARY SCHOOL for Newport Joint School Dist., NEWPORT, PA. LB **$650,000.** Will re-advertise. CD 7/16, under LB.

James J. Clearkin, Castor Ave. and Wingohocking St., Phila., Pa., CA, **$500,000,** CHURCH, PHILA., PA. St. Ambroses' Roman Catholic Church, 354 E. Roosevelt Blvd., Phila., Pa. CD 8/4.

Joseph R. Farrell, Inc., 4422 Market St., Phila., Pa., CA, **$996,996,** DORMITORY, VILLANOVA, PA. Villanova College, Villanova, Pa. Bids July 22. CD 8/6, under LB.

Henry A. Knott, 2 W. University Pkwy., Baltimore, Md. Owner Builds. **$800,000.** one hundred and sixty 2 story, masonry RESIDENCES, Mardo Ave., Clyde Ave., Brunswick Rd., Alma Rd., Saratoga Ave., Highland development, BALTIMORE, MD. CD 5/9.

▲ **Ralph W. Simmers & Sons, Inc.,** 6313 Kenwood Ave., Baltimore, Md. Separate Contracts. Est. **$2,500,000.** two hundred and eight 2 story, masonry row type RESIDENCES, near BALTIMORE, MD. CD 12/26/51.

Ira C. Rigger, 412 Delaware Ave., Towson, Md. CA. **$130,000.** 1 story, 86x180 ft., concrete block MANUFACTURING BLDG., E.S. of York Rd., 1,800 ft. north of Texas Lane, TEXAS, MD. Molded Products, Inc., Cockeysville, Md.

John McShain, Inc., 1501 N. Arlington Ridge Rd., Arlington, Va. LB, **$874,000,** est. $650,000. PARISH HALL, WASH., D. C. Church of the Annunciation, 39 St. and Massachusetts Ave. N. W., Wash., D. C. Bids July 14. CD 6/25.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ga., Warner Robins**—B.A. 8/26—City, sewage treatment plant, collection system and outfall sewers, $1,297,000. Extended date. Vinson & Co., 30 14 St. N. E., Atlanta, engrs. CD 5/18.

Ga., Warner Robins—B.A. 8/26—City, City Hall, treatment plant, distr. sys., ground and elevated water storage facilities. $708,000. Extended date. Vinson & Co., 30 14 St. N.S., Atlanta, engrs. CD 5/18.

Tenn., Hartsville—B.A. 8/26—City, WW imprvs. $125,-000. Plans deposit $25. Howard K. Bell, 533 S. Limestone St., Lexington, engr. CD 1/27/47.

† **Fla., Cocoa**—B.A. On or About 9/16—U. S. Eng., P.O. Box 4970, Jacksonville, steam plant and distr. lines addn., Air Force Missile Test Center, Patrick Air Force Base, Brevard Co. Serial No. ENG-08-123-54-13.

Ala., Birmingham—B.A. 9/22—Jefferson Co. Comn., Jefferson Co. Court House, Contract No. 2, Village Creek Sewage Treatment Plant. Plans deposit $100. Extended date. J. W. Goodwin Engr. Co., 2111 7 Ave. S., engr. C. J. Rogers, Court House co. engr. adv. ENR 8/20. CD 6/29.

BIDS ASKED—BUILDINGS

Fla., Clearwater—SCHOOL—B.A. 8/26—Pinellas Co. Bd. P. Instruction, Clearwater, Negro Junior-Senior High School, $650,000. Philip Kennard, 105 2 Ave. N. E., St. Petersburg, archt.

S. C., Union—CHURCH—B.A. 8/31—First Baptist Church Union, church. $500,000. Heyward S. Singley, 1845 Assembly St., Columbia, archt. CD 3/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WEST VIRGINIA—W. Va. Turnpike Comn., 1340 Wilson St., Charleston, Zone 9,
rejected bids July 14, Contract 22, 3 rigid frame bridges, Bridge No. 48 Mile 53-0; Bridge No. 50 at Mile 5.36 both near town of Westerly in Fayette Co.; and Bridge No. 59 at Mile 60.5 mi. near town of Burnwell in Kanawaha Co. LB **$445,660** Contract 22; LB **$249,185** Contract 22A. Will re-advertise. CD 7/17, under LB.

▲ **Codell Constr. Co.,** Winchester, Ky., CA, Est. **$3,-000,000.** grading 14 mi. track between Russellville and Landisburg, Fayette Co., WEST VIRGINIA. New York Central R. R. Co., F. H. Simpson, ch. engr., LaSalle St. Station, Chicago 5, Ill.

Lockhart Constr. Co., Durham, N. C., LB, **$60,851** sewer outfall, DURHAM, N. C. City, Durham, N. C. CD 5/17/51.

Fiske-Carter Constr. Co., P.O. Box 1251, Spartanburg, S. C., CA, **$77,364,** earthfill dam for water storage reservoir, ANDERSON, S. C. Duke Power Co., 422 S. Church St., Charlotte, N. C.

E. A. Hudson's Sons, Bolton, Ga. and **MacDougald Constr. Co.,** Northside Dr., Atlanta, Ga., LB, **$701,045** grading Chattahoochee River industrial site, ATLANTA, GA. Fulton Co., Court House, Atlanta, Ga. Bids Aug. 5. CD 7/17.

Birmingham Building Co., 909 7 Ave. S., Birmingham, Ala. LB, **$809,393,** natural gas distr. sys., CARTERSVILLE, GA. City, Cartersville, Ga. CD 6/15.

FLORIDA—State Road Dpt., Tallahassee,
Ewell Eng. Constr. Co., Lakeland, Fla., LB, **$280,570** concrete deck precast concrete piling bridges of 684 ft. and 300 ft. lengths, detour bridge of structural timber with timber piling, grading, paving, State Rds. No. 20 and 397, Toms Bayou and Boggy Bayou Bridges in Valparaiso and Niceville, Job 4704-109. Bids Aug. 4. CD 7/28.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
Langston Constr. Co., Orlando, Fla., LB, **$246,567** grading, stabilizing, paving, small drainage structures State Rd. No. 15, F 021-1 (3), Putnam Co.;

Hubbard Constr. Co., Orlando, Fla., LB, **$146,363** grading, paving, small drainage structures State Rd. S-434, S-255 (2), Seminole Co.;

Ewell Eng. & Constr. Co., Lakeland, Fla., LB **$79,356** grading, paving, 1 bridge, other drainage structures State Rd. 70, S-269 (2), De Soto Co.;

W. L. Cobb Constr. Co., 1102 N. 22 St., Tampa, Fla., LB, **$249,779,** grading, stabilizing, wid'n. existing pavement, resurf. entire pavement area, State Rd. 5, Job 9401-111 St. Lucie Co.;

Broward Asphalt Corp., Ft. Lauderdale, Fla., LB, **$143,-618** paving State Rd. 84, Job 8608-107, Broward Co.;

Troup Bros., Inc., 251 S. Dixie Hy., Miami, Fla., LB **$71,561** paving, State Rd. A-1A Job 8706-112, Dade Co.;

The Brewer Co. of Florida, Inc., 3900 N.W. 21 St., Miami, Fla., LB, **$159,951,** wid'n., resurf. Job 8759-150, Job 8760-150, Job 8762-150, Job 8722-151, Dade Co.;

Doyle Pope, Quincy, Fla., LB, **$71,454** paving, State Rd. 53, Job 3506-107, Madison Co. Bids Aug. 4. CD 7/28.

† **U. S. Eng.,** P.O. Box 1169, Mobile 7, Ala., rejected bids Administration Storage and Base Communications Bldg. 58, Inv. 53-58, EGLIN AIR FORCE BASE, FLA. LB **$217,100.** CD 5/27, under LB.

Chicago Bridge & Iron Co., 57 Forsyth St., Atlanta, Ga. CA, **$96,000,** elevated water storage tank, FORT MYERS, FLA. City, City Hall, Fort Myers, Fla.

Settecasi & Chillura, 2101 5 Ave., Tampa, Fla., LB, **$590,000,** baseball stadium, TAMPA, FLA. City, City Hall, Tampa, Fla. Bids July 30. CD 7/16.

City, City Hall, Jackson, Miss., rejected bids July 20, 36 in. water main from Riverside Dr. into downtown dist., JACKSON, MISS. LB **$753,960.** CD 7/31, under LB.

▲ **River Constr. Corp.,** Box 9127, Fort Worth, Tex. CA **$3,618,000.** 107 mi. 22 in. welded joint crude oil line, Shreveport to Baton Rouge, LOUISIANA. Interstate Oil Pipe Line Co., Standard Oil Co. Bldg., Shreveport, La. CD 8/21/52.

Drew Constr. Co., Jonesboro, Ark. CA **$133,219.** telephone lines, RESERVE, LA. Reserve Telephone Co., Reserve, La. Bids July 9. CD 6/25.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort,
Carey Constr. Co., Citizens Bank Bldg., Lexington, Ky. and **H. C. Adams,** 968 Delaware Ave., Lexington, Ky. CA **$107,388.** Alternate No. 2, b. conc. runways, taxiways, cement concrete aprons 0.53 mi. Capitol City Airport Runway, taxiway and apron area, SP 37-645, Franklin Co. CD 8/3, under Streets and Roads, LB.

Campbell Morgan Constr. Co., Harlan, Ky. LB **$101,350.** swimming pool, bath house, HARLAN, KY. City, Harlan, Ky. Bids July 27. CD 7/13.

W. A. Catlett Constr. Co., 3401 Chapman Hy. S. W., Knoxville, Tenn. CA **$510,972.** sidewalks at schools, KNOXVILLE, TENN. City, City Hall, Knoxville, Tenn. Bids July 24. CD 7/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Tidewater Constr. Corp.,** P.O. Box 598, Norfolk, Va. CA. **$3,256,805.** lardships, WAREHOUSES and water, steam and electric distr. systems, ENG-44-110-53-15, FORT EUSTIS, VA. U. S. Eng., foot of Front St., Norfolk, Va. CD 7/28, under LB.

▲ **English Constr. Co.,** Altavista, Va. LB **$1,193,700.** HIGH SCHOOL, LEESBURG, VA. Loudoun Co. Bd. Educ., Leesburg, Va. Bids July 28. CD 6/30.

▲ **George Goodyear Co.,** 216 W. 2 St., Charlotte, N. C. Owner Builds. **$1,000,000.** 91 RESIDENCES, Selwyn Park Addition No. 5, CHARLOTTE, N. C.

J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C., CA, **$500,000.** PLANT, CHARLOTTE, N. C. Standard Chemical Products, Inc., 1301 Jefferson St., Hoboken, N. J. CD 6/12.

▲ **S. J. Curry & Co.,** Albany, Ga., CA, **$1,873,117** HIGH SCHOOL, ALBANY, GA. Dougherty Co. Bd. Educ., Albany, Ga. Bids July 8. CD 7/14, under LB.

Morris A. Bryan, 1690 Stanton Rd. N. W., Atlanta, Ga. Owner Builds, **$300,000,** 29 RESIDENCES, ATLANTA, GA.

Mion Constr. Co., 377 Techwood Dr., Atlanta, Ga., CA, **$325,000,** CHURCH addn., ATLANTA, GA. Grace Methodist Church, 458 Ponce deLeon Ave., Atlanta, Ga.

Beecher Hills Baptist Church, 2430 Beecher Rd. N. W., Atlanta, Ga., rejected bids Apr. 28, CHURCH addn., ATLANTA, GA. LB, **$326,500.** CD 5/4, under LB.

Craven Development Corp., 304 Ponce deLeon Ave. N.E., Atlanta, Ga., Owner Builds, **$400,000** 40 RESIDENCES, ATLANTA, GA.

▲ **Bruce Bowen, Inc.,** Quincy, Fla., CA, **$1,293,271** Attapulgus High SCHOOL and ELEMENTARY SCHOOL No. 1, BAINBRIDGE, GA. Decatur Co. Bd. Educ., Bainbridge, Ga. Bids July 21. CD 7/27, under LB.

De Kalb Co. Bd. Educ., Decatur, Ga., rejected bids June 9, elementary SCHOOL, TUCKER, DECATUR, GA. LB, **$393,213.** CD 6/23, under LB.

▲ **Farnsworth & Chambers Co.,** P.O. Box 74, Houston, Tex. CA. **$4,120,000,** HOSPITAL, MACON, GA. City, City Hall, Macon, Ga. Bids Aug. 6. CD 8/10, under LB.

Fred Northen, Daytona Beach, Fla., Owner Builds, **$300,000,** 20 RESIDENCES, DAYTONA BEACH, FLA.

Wilber L. Kroetz, 534 N. E. 6 Ave., Fort Lauderdale, Fla., CA, **$330,000,** APARTMENT, FORT LAUDERDALE, FLA. Harbor Club, Inc., 3073 Harbor Dr., Fort Lauderdale, Fla.

Dobbs Constr. Co., 2774 N. W. 24 St., Miami, Fla., CA, $102,830, WAREHOUSE addn., HIALEAH, FLA. Universal Car Loading & Distributors Co., 1200 Seaboard Dr., Hialeah, Fla. Bids July 25. CD 7/24.

Brazelon Homes, Inc., c/o James A. Young, engr., First National Bank Bldg., Hollywood, Fla., Owner Builds, **$310,000,** 25 RESIDENCES, HOLLYWOOD, FLA.

Star Constr. Co., 1440 N. W. 21 St., Miami, Fla., CA, **$100,000,** WAREHOUSE OFFICE, MIAMI, FLA. Linold Corp., 990 S. W. 1 St., Miami, Fla.

▲ **Clutter Constr. Co.,** 8340 N.E. 2 Ave., Miami, Fla., LB. **$1,000,000,** HOTEL, MIAMI, FLA. Miami Biltmore Hotel, c/o A. Herbert Mathes, archt., 605 Lincoln Road Bldg., Miami Beach, Fla. Bids July 30. CD 7/24.

▲ **Babcock Co.,** 2990 Coral Way, Miami, Fla., Owner Builds, **$1,000,000,** 112 RESIDENCES, MIAMI, FLA.

Joseph Mann, 930 71 St., Miami Beach, Fla., CA Est. **$300,000,** APARTMENT, MIAMI BEACH, FLA. Troy Apartments, 960 Alton Rd., Miami Beach, Fla.

Paul Smith Constr. Co., 310 N. Rome Ave., Tampa, Fla., CA, **$100,000,** Cold Storage PLANT, TAMPA, FLA. Food Products Inc., c/o contractor.

The Austin Co., 16112 Euclid St., Cleveland, O., CA, **$245,000** cement PLANT, TAMPA, FLA. General Portland Cement Co., Hooker's Point, Tampa, Fla.

▲ **Daniel Constr. Co.,** P.O. Box 1511, Birmingham, Ala., LB. **$1,047,972** BANK addn., BIRMINGHAM, ALA. First National Bank, c/o Warren, Knight & Davis, archts., Protective Life Bldg., Birmingham, Ala. Bids July 30. CD 6/26.

Brice Bldg. Co., P.O. Box 1028, Birmingham, Ala., CA. **$431,565,** CITY HALL, FLORENCE, ALA. City, City Hall, Florence, Ala. Bids July 31. CD 7/14.

▲ **M. T. Reed Constr. Co.,** P.O. Box 1066, Jackson, Miss. LB, **$1,463,666.** Wilson Drive and Robinson Road High SCHOOLS, JACKSON, MISS. Jackson Municipal Separate School Dist., 256 E. Griffith St., Jackson, Miss. Bids Aug. 6. CD 7/20.

▲ **Hudson Engineering Corp.,** 2711 Danville St., Houston, Tex. CA **$1,500,000.** natural gas PLANT addn., LAKE CHARLES, LA. Continental Oil Co., Lake Charles, La. CD 8/11.

▲† **R. F. Ball Constr. Co., Inc.,** Builders Exchange, Transit Tower Bldg., San Antonio, Tex. LB. **$1,037,-237.** FOUNDRY, CLEANING BLDG., rein.-con. fdns. for equip., Michould Ordnance Plant, NEW ORLEANS, LA. U. S. Eng., P.O. Box 1229, Galveston, Tex. Bids Aug. 4. CD 7/1.

Nordberg Mfg. Co., 3073 S. Chase Ave., Milwaukee, Wis. CA. **$437,330** furnish, install electric power generator, OPELOUSAS, LA. City, Opelousas, La. Bids July 31.

Armstrong Constr. Co., 151 Shelby St., Kingsport, Tenn. CA **$767,500.** HIGH SCHOOL, BLOUNTVILLE, TENN. Sullivan Co. Bd. Educ., Blountville, Tenn. CD 7/31, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ind., Bedford**—B.A. 9/1—Bd. P. Wks., City Hall, sewage treatment plant and sewerage system. $1,-600,000. Bevington, Tagnart & Fowler, 730 Ind. Pythian Bldg., Indianapolis, Zone 4, consult. engrs. CD 1/13.

▲ **OHIO**—B.A. 9/9—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,

Portage Co.—Contract C-8, grading, drainage, structures, paving 4.69 mi. Constr. Sect. 8 Ohio Turnpike Proj. No. 1, beginning at point about 1.75 mi. northeast of Newton Falls near Ravenna-Warren Road at Turnpike centerline Station 215 plus 00 to Trumbull Co., extending in northwesterly direction to point about 0.65 mi. west of Trumbull Co. line at Turnpike Centerline Station 1042 plus 66, constr. engineer office bldg., facilities on or near site of the work;

Contract C-9, grading, drainage, structures, paving 4.61 mi. Constr. Section 9 of Ohio Turnpike Proj. No. 1, beginning at point about 0.65 mi. west of Trumbull Co. line said point being the same as Turnpike Centerline Station 1042 plus 66 and extending in westerly direction to point about 5.25 mi. west of Trumbull Co. line and about 0.6 mi. north of state Rte. 303 at Turnpike Centerline Station 799 plus 78 in Portage Co.;

Contract C-10, grading, drainage, structures, paving 4.6 mi. Construction Section 10, Ohio Turnpike Proj. No. 1, beginning at point about 5.25 mi. west of Trumbull Co. line and about 0.6 mi. north of State Rte. 303 at Turnpike Centerline Station 799 plus 78 in Portage Co. and extending in westerly direction to point about 0.5 mi. west of Limeridge Rd. at Turnpike Centerline Station 556 plus 60 in Portage constr. engineer's office bldg. and facilities, on or near the site of the work. CD 7/15, under LB.

† **MICHIGAN**—B.A. 9/11—U. S. Forest Service, Post Office Bldg., East Tawas,

Iosco Co.—plant mix bit. surf. 14.441 mi. about ¾ mi. west of Oscoda to Lumbermen's Monument, Michigan Forest Hy. Proj. No. 1-A; adv. ENR 8/20.

BIDS ASKED—BUILDINGS

Wis., Neillsville—HOSPITAL—B.A. 8/27—City, Dr. M. V. Oreman, member Hospital Bd., 22 ft. long, one part 66 ft. wide and another part 42 ft. wide community hospital. $450,000. Magney, Tusler & Setter, 202 Foshay Tower, Minneapolis, Minn., archts.

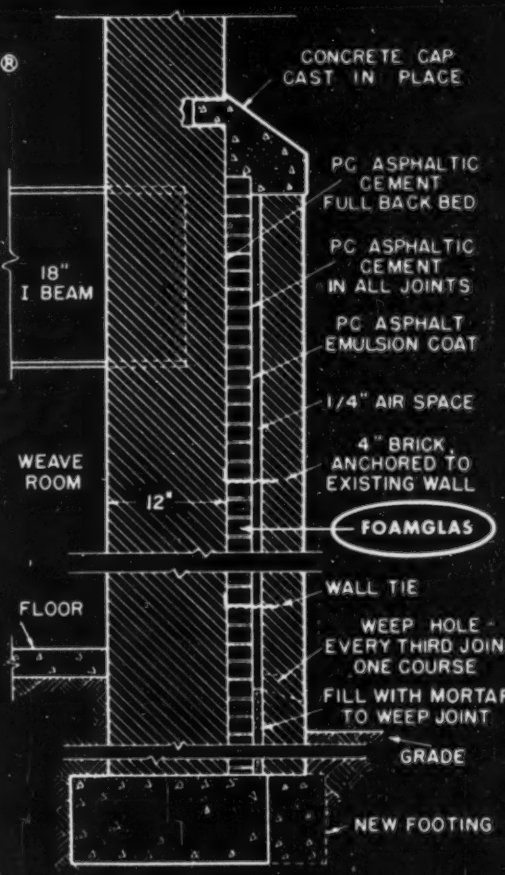
Ill., Oak Park—SCHOOL, etc.—Bids Asked—Ascension Parish, 601 Van Buren St., school and gymnasium. $450,000. McCarthy & Smith, 69 W. Delaware St., Chicago, Zone 10, archts. CD 8/15/52.

SOON LETS CONTRACT—BUILDINGS

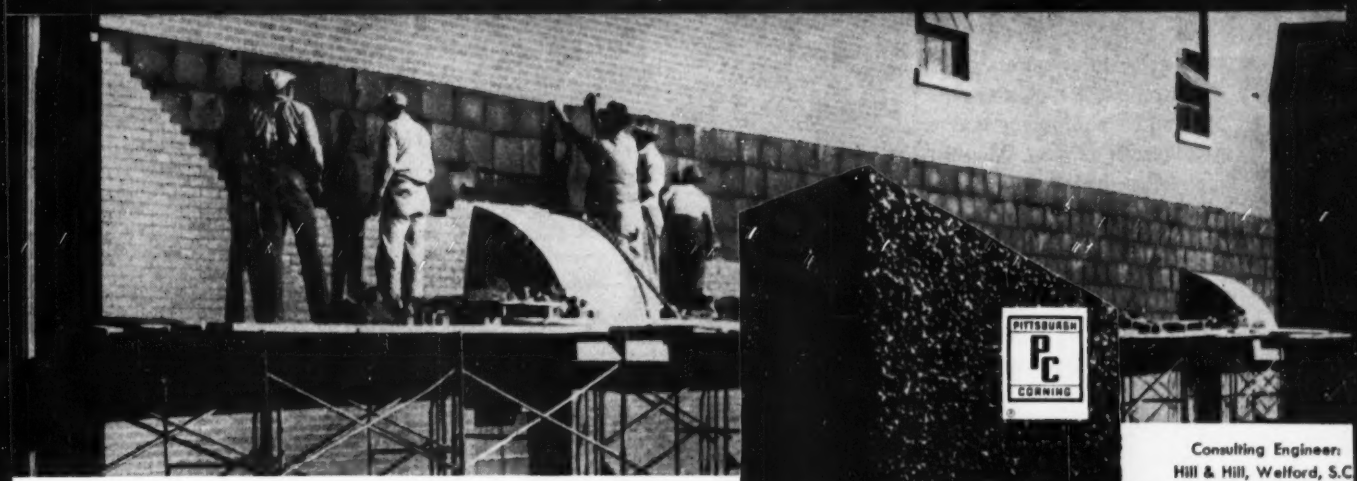
Mich., Cheboygan—CONVENT—St. Mary's R. C. Parish, James H. Moloney, pastor, soon lets contract 2 story, brick, steel convent, East and North Sts. Richard A. Lawson, 122 S. Bailey St., archt.

(Continued on page 130)

"FOAMGLAS® insulation stopped condensation without shutting down our weave room"



WALL SECTION



Consulting Engineer:
Hill & Hill, Welford, S.C.

M. Lowenstein & Sons' Vice President and Plant Superintendent, T. G. Roche, reports: "At our Limestone Mills, Gaffney, S.C., we benefited two ways from FOAMGLAS insulation. . . . It has eliminated permanently condensation on the weave room walls, enabling us to maintain constantly the required 80° temperature and 85% humidity. Also, we were able to install the rugged, waterproof blocks of FOAMGLAS outside the walls, avoiding a costly stoppage of the looms for weeks."

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- Equipped for your job
- easy to handle
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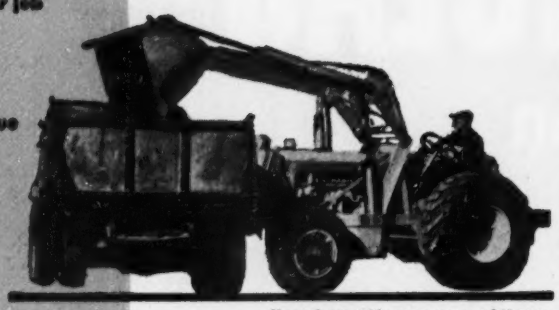

Up and out, with power to spare! Heavy-duty MM Wheelers offer the important advantages of proved conventional design.

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CONVENTIONAL DESIGN FOR FRONT OR REAR END ATTACHMENTS

You get *more work* out of MM Wheelers with this conventional design that handles a *bigger* variety of attaching equipment. Front and rear mounted equipment makes *both* ends of your Wheeler pay. Practical drawbar applications further reduce machinery investments. MM design combines economy of first cost; fast, easy operation; ability to handle *more* tool types, and real operating safety.

Let your MM distributor demonstrate. See for yourself why MM owners call their Wheeler and equipment combination the "one man contractors."

MORE WORK from more equipment! MM Wheeler owners get all the advantages of design that make both ends pay — like this 2 yd. scraper.

Provisions for rear mounting give you real back-hoe performance. Again, Wheeler design pays off with more work from standard design.

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

(Continued from page 128)

Mich., Dearborn—CONVENT—Church of the Divine Child, c/o Herman & Simons, 1150 Griswold St., Detroit, soon lets contract 2 story, brick, concrete convent. $300,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **OHIO**—Bureau P. Rds., Dpt. Commerce, 1440 Columbus Pike, Arlington, Va.,

Maizen Co., Box 19, Middleport, O. LB. **$233,711.** bit. paving, rein.-con. bridge, etc. from Wakefield to south boundary of A. E. C. Plant, Proj. Ohio AA-8, Pike Co. Bids Aug. 4. CD 7/15.

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,

American Bridge Div., U. S. Steel Corp., 1302 Union Trust Bldg., Cincinnati, O. LB, **$1,166,831.** Contract M-4B, consists of sale incl. delivery of fabricated structural steel, and appurtenant steel items for bridge structures, Ohio Turnpike, Portage and Summit Counties. Bids July 29. CD 7/9.

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,

Launder & Son and Pierce Constr. Co., Glendale Ave., Toledo, O., CA, **$6,891,388**, bridges and roads 12.1 mi. of Turnpike, Contr. C-51, Contr. C-52, Contr. C-50, Lucas and Fulton Counties. Bids July 29, awarded Aug. 4. CD 7/31, under LB.

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,

Terry & Wright and Calumet Paving Co., W. 8 St., New Albany, Ind., CA. **$6,588,822.** Bridges, Contracts C-53, C-54-C,55, incl. 11.5 mi. grading, drainage, structures, paving Fulton Co. Bids Aug. 5, awarded Aug. 7. CD 8/11, under LB.

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,

Allied Structural Steel Companies, 20 N1 Wacker Dr., Chicago, 6, Ill., CA **$1,147,393**, Contract M-4B, furnishing fabricated structural steel for bridge structures in Portage and Summit Counties. Bids July 29, awarded Aug. 7. CD 8/11, under LB.

General Construction Co., 1221 E. Fifth Ave., Columbus, O. CA, Est. **$750,000**, 9 mi. c. conc. streets, 26 to 62 ft. wide, storm sewers in Lincoln Village, COLUMBUS, O. People's Development Corp., N. High St., Columbus, O.

▲ **ILLINOIS**—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

Black Top Roads Co., 1929 N. Narragansett Ave., Chicago, 39, Ill., LB. **$196,406**, bit. resurf. 10.43 mi. Ill. 64, DuPage and Kane Counties; LB. **$62,612** bit. resurf. 6.11 mi. Ill. 83, Du Page Co.; LB. **$128,410** bit. resurf. 7.31 mi. Ill. 64, Du Page Co.;

Maclair Asphalt Co., Inc., 6000 Collinsville Rd., East St. Louis, Ill., LB. **$143,318**, bit. 5.33 mi. Ill. 43, Randolph Co.; LB. **$222,627**, bit. resurf. 5.25 mi. Ill. 161, St. Clair Co.; LB. **$181,576** bit. resurf. 7.04 mi. U.S. 460, St. Clair Co.;

Eric Bolander Constr. Co., Winchester Rd., Libertyville Ill., LB. **$109,345**, c. conc. base course wid'n., 6.26 mi. Ill. 63, Lake Co.; LB. **$90,741**, c. conc. base course wid'n. 3.06 mi. Ill. 42, Lake Co.;

M. Hoeffken Co. and Hoeffken Bros. Inc., 22 W. "B" St., Belleville, Ill., LB. **$551,085**, c. conc. base course wid'n. 5.24 mi. Ill. 161, St. Clair Co.; LB. **$99,631**, conc. base course wid'n., 5.33 mi. Ill. 43, Randolph Co.;

Peter Baker & Sons Co., 1190 Conway Rd., Lake Forest, Ill., LB. **$84,175** bit. resurf. 422 mi. Ill. 131 and 132, Lake Co.; LB. **$92,078**, bit. resurf. 3.21 mi. Ill. 42, Lake Co.;

Geneva Constr. Co., 303 Old Ind. National Bank Bldg., Aurora, Ill., LB **$329,551**, bit. resurf. 11.12 mi. U.S. 30, Will, Kendall and Kane Counties; LB. **$320,895**, conc. base course wid'n., 10.67 mi. U.S. 30, Will, Kendall and Kane Counties;

Arcole Midwest Corp., 3225 Main St., Evanston, Ill., LB. **$97,920**, bit. resurf. 2.46 mi. Ill. 42, Cook Co.;

Arrow Petroleum Co., 7419 Franklin St., Forest Park, Ill., LB. **$124,273**, bit. resurf. 9.71 mi. U.S. 34, Kendall, Kane and Du Page Counties;

J. D. Barter Constr. Co., 215 S. Jackson St., Harrisburg, Ill., LB. **$267,284**, grading 1.98 mi. F.A. 160, Clay Co.;

Robt. A. Black, Inc., 12912 S. Halsted St., Chicago 27, Ill., LB. **$86,853**, c. conc. base course 1.44 mi. Ill. 42, Cook Co.;

J. C. Bremer, 928 S. Main St., Hillsboro, Ill., LB. **$358,929.** conc. base course wid'n., 14.66 mi. Ill. 111, Macoupin, Jersey and Madison Counties;

J. C. Bremer & T. L. Flatt & Sons, 928 S. Main St., Hillsboro, Ill., LB. **$361,352**, bit. resurf. 14.81 mi. Il. 111, Macoupin, Jersey and Madison Counties;

Contracting & Material Co., 1235 Dodge Ave., Evanston, Ill., LB. **$207,894**, bit. resurf. 11.65 mi. U.S. 20, Du Page Co.;

Crown Rock Asphalt Co., 178 Addison St., Elmhurst, Ill., LB, **$151,457**, bit. resurf. 3.69 mi. U. S. 30, U. S. 6, Ill. 7, Will and Cook Counties;

Freeport Black Top Constr. Co. & C. H. Rumberg, 1122 S. Burchard Ave., Freeport, Ill., LB. **$205,969.** b. conc. 5.24 mi. or bit. F.A.S. 886, White Co.;

Fuller Paving Constr. Co., 79 W. Monroe St., Chicago, 3, Ill., LB, **$126,826**, bit. resurf. 3.06 mi. Ill. 4, Cook Co.;

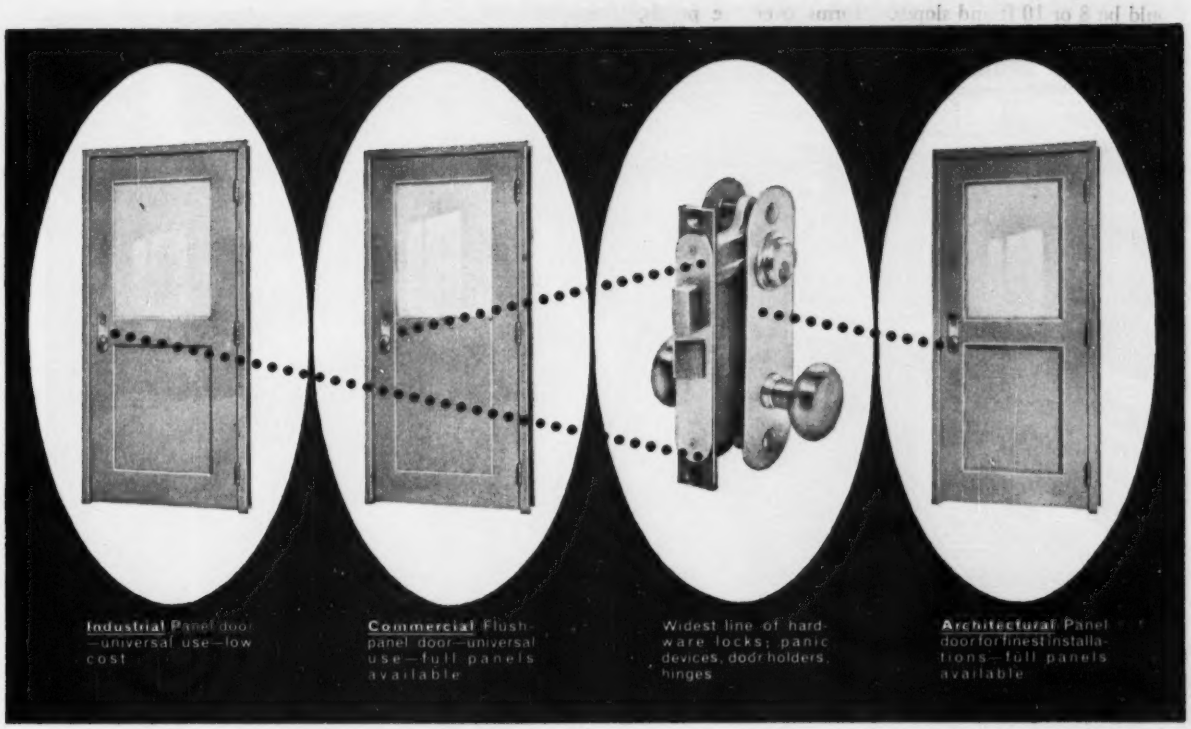
Gallagher Asphalt Co. Inc., 181 St. and Indiana Ave. Thornton, Ill., LB, **$102,619**, bit. resurf. 4.1 mi. Ill. 52, Cook Co.;

Giertz-Melahn Asphalt Co., 57 Douglas Ave., Elgin, Ill., LB, **$230,766.** bit. resurf. 16.1 mi. Ill. 64, DeKalb and Kane Counties;

H. G. Goelitz Co., 5757 Ogden Ave., Chicago, Ill., LB, **$85,837**, bit. resurf. 1.44 mi. F.A. 99, Cook Co.;

Mitchell Contg. Co., 216 E. Madison St., Herrin, Ill.,

(Continued on page 133)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Commercial Flush-panel door—universal use—full panels available
Widest line of hardware locks; panic devices, door holders, hinges
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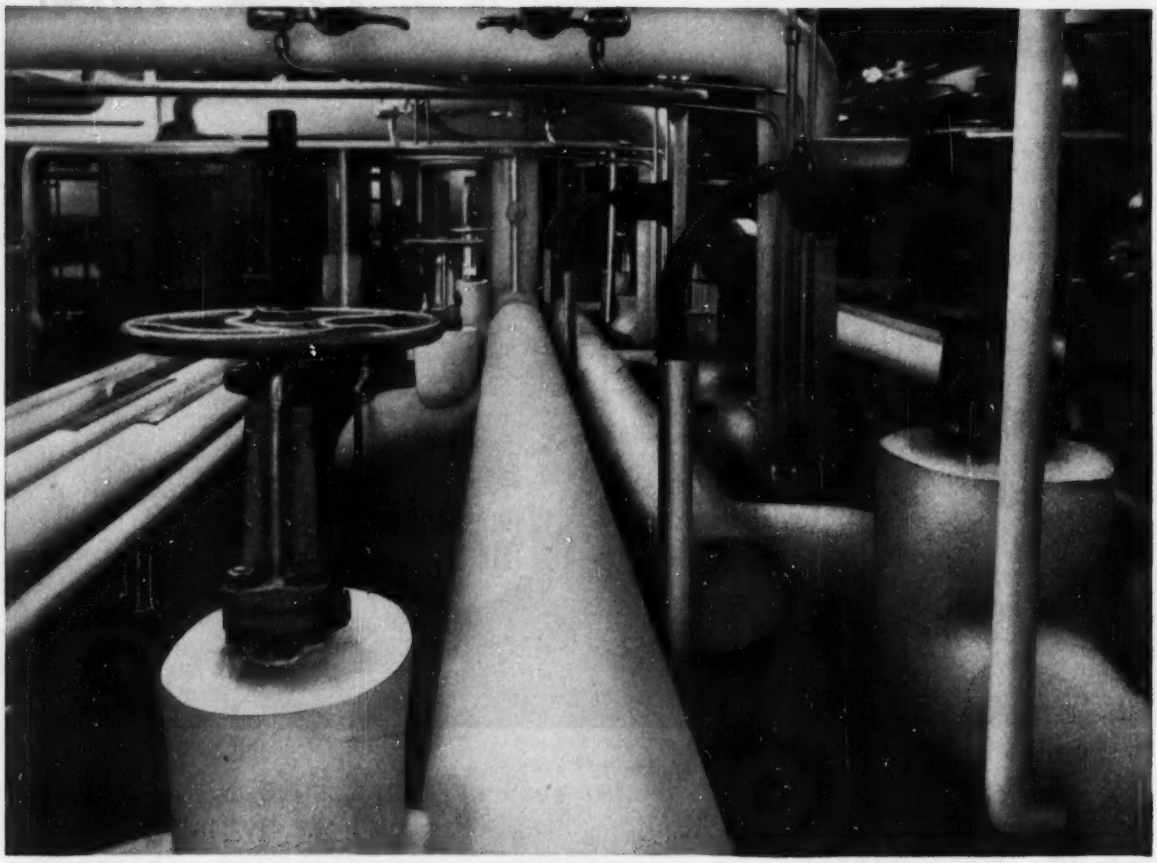

View of Pipe bay in large eastern utility plant, showing pipes insulated with K&M "Featherweight" 85% Magnesia.

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Insulate with "Featherweight"

85% MAGNESIA

Save heat and you save money. Thousands of plants depend upon "Featherweight" 85% Magnesia to do just that. And no wonder!

"Featherweight" needs no introduction to thousands of users, many of whom first experienced its unusual qualities before this century began.

It is a superb insulation, low in thermal conductivity and not only effective on heated surfaces with temperatures up to 600° F., but when used in combination with K&M Hy-Temp Insulation, it is efficient up to 1900° F. This combination of double layers permits staggering all joints and eliminating heat loss through open joints when expansion occurs.

Keep this heat-saving, money-saving insulation in mind for applications in *your* company's plants. It will serve you well—always! For detailed information on "Featherweight" 85% Magnesia, see your local K&M distributor, who is an experienced applicator, or write directly to us.

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(Continued from page 130)

LB, $417,851, c. conc., conc. base course, bit. resurf. 2.69 mi., 1 superstructure for existing Bridge Ill. 148 and 149 Franklin Co.;

Moore Bros. Inc., 2000 St. Clair Ave., East St. Louis, Ill., LB, $421,566, c. conc. base course, 0.54 mi. c. conc. base course wid'n. 6.45 mi. 1 bridge superstructures, U. S. 460 St. Clair Co.;

Sankey Bros. Inc., 402 Illinois Bldg., Springfield, Ill., LB, $94,511, bit. resurf. 4.62 mi. Ill. 4, Sangamon Co.;

Scheflow-Monahan, 466 Main St., Glen Ellyn, Ill., LB $120,996, c. conc. base course wid'n. 9.04 mi. U. S. 34. Kendall, DuPage and Kane Counties;

Suburban Oil Co., 7340 W. 51 St., Forest Park, Ill. LB, $82,053, bit. resurf. 6.68 mi. U. S. 20, McHenry and Kane Counties,

Skokie Valley Asphalt Co., 1228 Harding Ave., Des Plaines, Ill., LB, $97,891, bit. resurf. 6.49 mi. Ill. 63, Lake Co. Bids Aug. 7. CD 7/29.

▲ **ILLINOIS**—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

Bethlehem Steel Co., Airport Hangar, Schoenersville, Bethlehem, Pa., LB, $163,782, furnishing structural steel for grade separation of Western Ave. and Congress St. Expressway, F. A. 131; LB, $91,150. furnishing structural steel for grade separation of Leavitt St. and Congress St. Expressway F. A. 131, Chicago, Cook Co.;

S. J. Groves & Sons Co., 1104 W. Reynolds St., Springfield, Ill., LB, $106,162, 1 railroad viaduct, 1 bridge approach slabs on U. S. 45, Johnson Co.;

R. W. Ford, 704 S. Market St., Marion, Ill., LB, $120,914 widening 2 bridges and culvert extens., Ill. 37, Williamson Co.;

G. E. Tillman Co., Inc., 702 N. Locust St., Centralia, Ill., LB, $753,568, substructure, structural steel for subway under railroads and hy. grade separation structure Ill. 161, Centralia, Marion Co.;

Eric Bolander Constr. Co., Winchester Rd., Libertyville, Ill., LB, $102,730, railroad viaduct and paved approaches Ill. 131, Lake Co.;

Shappert Eng. Co., Menominee and Blaine Sts., Belvidere, Ill., LB, $98,321, 1 bridge, misc. roadway Ill. 2, Winnebago Co. Bids Aug. 7. CD 7/29.

Herlihy-Mid Continent Co., 135 S. La Salle St., Chicago 3, Ill., LB. $298,188, bridge at Bryn Mawr Ave. part of Lake Shore Drive Extension. CHICAGO, ILL. City, City Hall, Chicago, 2, Ill. Bids July 30. CD 7/17.

J. M. Corbett Co., 2501 Salt St., Chicago, Ill., LB $959,185, paving, draining, retaining wall, curbs and gutters, South Shore Dr. from 31 to 39 Sts., CHICAGO, ILL. Chicago Park District, 425 E. 14 St., Chicago, 5, Ill. CD 6/12/52.

WISCONSIN—State Hy. Comn., State Hy. Office Bldg., Madison,

Stroshine & Gehrke. Merrill, Wis., LB. $289,123. Contract 1, grading, base course 9.178 mi. Proj. F.H.P. 5-A, Price Co.;

Mike Oliver Co., 100 E. Washington Ave., Madison, Wis., LB. $164,039, Contract 1, c. conc.-asph. 0.633 mi. Proj. U-5208 (1) Dane Co.;

Lampert & Lampert, Inc., Oshkosh, Wis., LB. $63,393. Contract 1, c. conc.-b. conc. 0.123 mi. Proj. U 091-(14), Outagamie Co.;

L. G. Arnold, Inc., Eau Claire, Wis., LB. $176,728. Contract 1, c. conc. 0.955 mi. U-5103 (2) and T 0125 (1), La Crosse Co.;

Rock Road Constr. Co., 5711 Winnequah Rd., Madison, Wis., LB. $102,650, Contract 1, aggreg. bit. 5.215 mi. Proj. S 0454 (2), Rock Co.;

Mathy Constr. Co., 508 Hoeschler Bldg., La Crosse, Wis., LB. $111,967, Contract 1, b. conc. 5.101 mi. Proj. S 0119 (9) and S 0119 (2) Trempleau and La Crosse Counties. Bids Aug. 4. CD 7/17.

WISCONSIN—State Hy. Comn., State Hy. Office Bldg., Madison,

Adolph Cherney & Victor Zemzn, Maribel, Wis., CA, $603,684, Contract 1, c. conc. 3.488 mi. Proj. F-09-1 (6) and F-3561 (5), Shawano Co. Bids July 21. CD 7/28, under LB.

Werner Co., 9511 Harding Blvd., Wauwatosa, 13, Wis., CA. $82,439, sewers in 68 St., W. Holt Ave. and W. Stack Dr., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids July 30, awarded July 31.

Dykhouse Brothers, 445 N. Ferry St., Grand Haven, Mich. CA. $68,901. sanitary interceptor sewer Roosevelt Park, GRAND RAPIDS, MICH. City, City Hall, Grand Rapids, Mich. Millard M. Moore, city engr. CD 6/20/52.

▲ **C & C Constr. Co. and Clifton Engineering Co.**, 2001 E. Pontiac St., Fort Wayne, Ind. CA. $2,143,996. Contr. 1, sewage disposal treatment plant facilities, incl. all appurtenances.

Getman Brothers, South Haven, Mich. CA. $842,642. Contr. 2, interceptor sewer, pumping station, appurtenances, piping, KALAMAZOO, MICH. City, P. Wks. Dpt., Kalamazoo, Mich. CD 7/21, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Campbell Constr. Co.**, 9301 Michigan Ave., Detroit, 10, Mich., CA, Est. $1,500,000, ceramics PLANT, CAMBRIDGE, O. Champion Spark Plug Co., 900 Upton St., Toledo, O. CD 2/25.

Bd. Educ., Southard Ave., Toledo, O., rejected bids June 3, general contract PHYSICAL EDUCATION addn. to Scott High School, TOLEDO, O., LB, $564,900. CD 6/9, under LB.

Dunlap & Co., Columbus, Ind., CA, $500,000, 54 two story, brick, frame DWELLING UNITS, COLUMBUS, IND. Village Gardens Corp., Columbus, Ind. Harry Weese, 612 N. Michigan Ave., Chicago, Ill., archt. Awarded Aug. 3.

▲ **Robert J. Allen, Spacemaker Homes Inc.**, 634 W. Berry St., Fort Wayne, Ind., Owner Builds, $1,000,000. 43 HOMES in Indian Hills Addn. and Indian Village, FORT WAYNE, IND.

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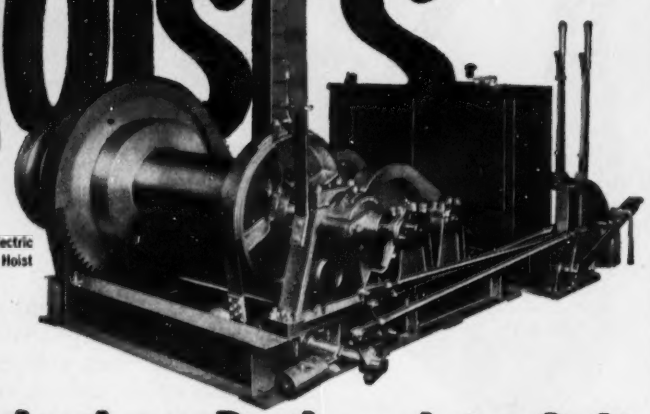

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CONSTRUCTION COSTS YEARBOOK

October 8, 1953

Order extra copies in advance—$2.00 each

Carl E. Erickson, 4657 Ravenswood St., Chicago, 40, Ill., CA, $800,000, 4 story, 80,000 sq. ft., concrete frame WAREHOUSE, Chicago and Crawford Aves., CHICAGO, ILL. E. J. Brach & Sons Co., Kinzie and Kilpatrick Sts., Chicago, Ill. J. A. Scanlan, 2323 Pioneer Ave., Evanston, Ill., engr. Awarded July 30. CD 12/10.

J. Emil Anderson & Son, 1819 Balmoral St., Chicago, 4, Ill., CA, $350,000, FACTORY, EVANSTON, ILL. Micro Precision, Inc., 2205 Lee St., Evanston, Ill. Arthur J. Heda, 1809 Balmoral St., Chicago, 40, Ill., archt. Awarded July 29.

Solberg & Sullivan, 3611 Oakton St., Skokie, Ill., CA, $300,000, SCHOOL addn., SKOKIE, ILL. St. Peters Parish, 8116 Niles Center Rd., Skokie, Ill. Barry & Kay, 53 W. Jackson Blvd., Chicago, 4, Ill., archts. Awarded July 30.

▲ **Foremost Builders, Inc.**, 4242 Dempster St., Skokie, Ill., Owner Builds, $1,400,000, 100 HOMES along Eastern boundary of town, N. of Main St., SKOKIE, ILL. Adam Hydzik, 4901 W. Parker Ave., Chicago, archt.

Siesel Constr. Co., 514 E. Ogden Ave., Milwaukee, 2, Wis., CA. 1 and 2 story, irregular 164x216 ft. HIDE HOUSE addn., MILWAUKEE, WIS. Pfister & Vogel Tanning Co., 1531 N. Water St., Milwaukee, 2, Wis. Bids July 21. CD 7/8.

Hunzinger Constr. Co., Butler, Wis., CA, $160,000. 1 story, 60x201 ft., and 47x72 ft. WAREHOUSE-OFFICE, MILWAUKEE, WIS. Crucible Steel Co., 4100 W. Douglas Rd., Milwaukee, Wis.

Campbell Constr. Co., 9301 Michigan Ave., Detroit, Mich. CA, $152,000. 1 story, brick, masonry PLANT, Scotten St., DETROIT, MICH. Cadillac Motor Co., General Motors Corp., 2860 Clark St., Detroit, Mich. CD 6/24.

▲ **Koppers Co., Inc.**, Koppers Bldg., Pittsburgh, Pa. CA rebuilding and enlarging "A" BLAST FURNACE to produce 500,000 tons per year at Zug Island, near, DETROIT, MICH. Great Lakes Steel Corp., unit of National Steel Corp., 2800 Grant Bldg., Pittsburgh 19, Pa.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Kan., Great Bend—B.A. 8/26—City, at office A. W. Herzog, city clk., sewage pumping station. Plans deposit $5. Wilson & Co., 223 N. Santa Fe St., Salina, engrs.

† **New Mexico**—B.A. 9/1—Bureau Reclamation, Dpt. Interior, U. S. Court House, El Paso, Tex., Picacho South Dam La Cruces Division, New Mexico-Rio Grande Project, 5 mi. northwest of Las Cruces, Dona Ana Co., Spec. DC-4002. adv. ENR 8/20. CD 9/7/44.

Tex., Laredo—B.A. 9/1—City, drainage, $60,000. Plans deposit $20. Frank T. Drought, 117 W. Pecan St., San Antonio, engr. CD 11/23/49.

Neb., Omaha—B.A. 9/15—City, City Hall, 18 and Farnam Sts., incinerator. $750,000. R. F. Ferguson, W.O.W. Bldg., consult. engr. CD 7/21.

BIDS ASKED—BUILDINGS

▲ **Minn., Blue Earth**—SCHOOL—B.A. 8/25—Bd. Educ., M. Yvonne Russ, clk., 3 story Senior High School, $1,100,000, Haarstick, Lundgren & Assoc., 1385 First National Bank Bldg., St. Paul, archts. CD 12/23.

▲ **Minn., Minneapolis**—OFFICE—B.A. 8/28—Prudential Insurance Co. of America, C. M. Shanks, pres., 763 Broad St., Newark, N. J., 10 story tower, 8 story wing, 4 story wing, 280,000 sq. ft. office Wayzata Blvd. and France Ave. $6,000,000. Extended date, Magney, Tusler & Setter, 202 Foshay Tower, archts. CD 7/22.

† **Neb., Sidney**—MAINTENANCE FACILITIES—B.A. 9/3—U. S. Eng., 1709 Jackson St., Omaha, ammunition normal maintenance facilities, Sioux Ordnance Depot, Inv. 25-066-54-16. CD 9/9.

▲ **Okla., Oklahoma City**—SCHOOL—B.A. 9/10—Bd. Educ., 400 N. Walnut St., Classen High School, 27 and May Sts., $1,500,000. Hudgins Thompson & Ball, 1100 W. Main St., archts. CD 10/15.

SOON LETS CONTRACT—BUILDINGS

Minn., St. Paul — TERMINAL — Northland Greyhound Lines, 509 Sixth Ave. N., Minneapolis, soon lets contract, 2 story, bsmnt., 65x167 ft., 1 story, 65x118 ft. bus terminal, St. Peter and Ninth Sts. $509,000, W. S. Arrasmith, 410 Lincoln Bank Bldg., Louisville, Ky., archt., L. Johnson, 317 Hamm Bldg., assoc. archt. CD 1/27.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Jansen Constr. Co., Beatrice, Neb., CA, $36,212, Section 1, water pipe lines, GLENWOOD, IA. City, Glenwood, Ia. Bids Aug. 4. CD 7/15.

† **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. LB $664,250. est. $529,023. altering approaches north ends ASB and Hannibal Bridges, piers, abutments, strengthen levee, Kansas City, Clay Co., CIVENG-23-028-53-212, MISSOURI. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. Bids Aug. 6. CD 6/19, under LB.

▲ † **Lytle & Green**, P. O. Box 206, Sioux City 2, Ia., LB, $5,143,152, earthwork, Stage III, Oahe Reservoir, near Pierre, Inv. 25-066-53-284, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Aug. 7. CD 7/2.

Parks Constr. Co., 719 S. 9 St., Omaha, Neb., LB, $238,733, ramp imprvs., incl. apron pavement, floodlights at municipal airport, OMAHA, NEB. City, City Hall, Omaha, Neb. Bids Aug. 4. CD 7/28.

L. G. Barcus & Sons, 1430 State St., Kansas City, Kan. LB $653,946. raise, widen, reconstr. East Kansas Avenue Bridge, KANSAS CITY, KAN. Wyandotte Co., Kansas City, Kan. Bids July 30. CD 6/30.

(Continued on page 136)

4 Powerful Reasons Why CHEVROLET ADVANCE-DESIGN TRUCKS will save money on *your* job . . .

EXTRA THRIFTY POWER! The improved Loadmaster engine in heavy-duty models has new high-compression ratio (7.1 to 1) to squeeze more power . . . more work out of every drop of fuel. In light- and medium-duty models, Chevrolet's advanced Thriftmaster engine delivers top-notch operating economy. Both give you the extra-long life and day-in, day-out dependability for which Chevrolet valve-in-head truck engines are famous.

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(Continued from page 134)

▲ **M. K. Eby Constr. Co., Inc.,** 610 N. Main St., Wichita, Kan. LB. $1,012,990. general contract;
Davidson Plumbing & Heating Co., 301 Laura St., Wichita, Kan. LB. $307,303. heating, plumbing, ventilating, air-conditioning;
Southwestern Electrical Co., 1231 N. Market St., Wichita, Kan. LB. $145,000. electrical work terminal bldg. at municipal airport, WICHITA, KAN. City, City Hall, Wichita, Kan. Bids July 29. CD 7/23.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City,
J. H. Barton Co., 1916 N. Broadway, Oklahoma City, Okla., CA $177,788, est. $203,263, steel bridge over Cache Creek Hy. 58, Apache, Caddo Co. Bids Aug. 4, awarded Aug. 5. CD 7/29.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,
bids Aug. 4 not opened c. conc. paving 0.254 mi. H. 22 A, Bartlesville, Washington Co. $63,928. CD 7/29.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,
Park-Ward Co., Commerce Exchange Bldg., Oklahoma City, Okla., CA, $315,746, est. $378,293, b. conc. 7.29 mi. Hy. 29, Velma Stephen Co.; CA $79,433, roadbed 7.16 mi. Hy. 58 Apache, Caddo Co.;
Steinberg Constr. Co., Riverside Dr., Tulsa, Okla., CA $95,945, est. $99,931, roadbed, bit. 2.057 mi. Hy. 88, Imola, Rogers Co.;
Tex. Baughman Co., 4400 N.W. 10 St., Oklahoma City, Okla., CA, $83,264, est. $99,764, roadbed 4.64 mi. Hy. 18B Meeker, Lincoln Co.;
Smith Bros., Noble, Okla., CA $64,837, grade, wid'n., 6.09 mi. U.S. 77, Noble, Cleveland Co. Grand total $639,225. Bids Aug. 4, awarded Aug. 5. CD 7/29.
City, City Hall, Ardmore, Okla., rejected bids Aug. 3, sewage disposal plant, ARDMORE, OKLA. LB, $273,200. CD 7/21.
Texas Bitulithic, 2121 Irving Blvd., Dallas, Tex. LB $195,298. constr. Belt Line Rd. Proj. No. 351-C-1 from Proj. 351-C North to State Hy. 78, GARLAND, TEX. Dallas Co. Rd. Dist. No. 1, Court House, Dallas, Tex. Bids Aug. 3. CD 7/27.

† **MONTANA**—Bureau P. Rds., Dpt. Commerce, Post Office Bldg., Missoula,
McCandles & Howe, Moses Lake, Wash. CA. $96,695. clearing, grubbing, grading, drainage 4.5 mi. South Fork Meadow Creek Rd., Proj. Kootenai 524-B, Lincoln Co. Bids July 28. CD 7/24.

† **MONTANA**—Bureau P. Rds., Dpt. Commerce, Post Office Bldg., Missoula,
Tirrell & Co., Missoula, Mont. CA $291,977. clearing, grubbing, grading, draining 18 mi. Whale Creek and Hay Creek-Shorty Creek Rds., Proj. Flathead 318-A and 376-A, Flathead Co. Bids July 30. CD 7/24.

† **Westinghouse Electric Corp.,** G. & E. Bldg., Denver, Colo., CA, $142,640, Schedule 1, four auto transformers with lightning arresters for Casper Substation, Kendrick Proj., Spec. 703X-305, WYOMING, Bureau Reclamation, Dpt. Interior, Casper, Wyo. Bids May 21, awarded July 28. CD 4/28.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver
Inland Constr. Co., Hynds Bldg., Cheyenne, Wyo., CA, $148,439, est. $167,660, soil cement, asph. processing 8.654 mi. State Hy. No. 71 from south of Brush to Woodrow School S 0021 (2), Morgan and Washington Counties. Bids July 31, awarded Aug. 5. CD 7/24.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,
Brown Construction Co., 1530 E. Abriendo Ave., Pueblo, Colo., CA, $297,573, est. $268,848, asph. 5.159 mi. State Hy. 93, AA-13 Unit 1, Boulder and Jefferson Counties;
Broderick & Gibbons, Inc., 600 East and Santa Fe. Trail Pueblo, Colo., CA, $269,862, b. conc. 3.353 mi., mixed asph. 8.48 mi. Comb. Colo. Proj. FI 002-2 (29) and C 02-001-13, Pueblo Co. Bids July 30, awarded July 31. CD 7/24.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Hagstrom Constr. Co.,** 1567 Selby Ave., St. Paul, Minn. CA $1,027,000. two 1 story wings, bsmnt., 200x450 ft. veterans' SERVICE BLDG., ¾ mi. south of State Capitol, ST. PAUL, MINN., State Veterans Service Bldg. Comn., W. H. Fallon, secy., 1746 Court House, St. Paul, Minn. CD 8/4, under LB.

▲ **M. K. Eby Constr. Co., Inc.,** 610 N. Main St., Wichita, Kan., CA general contract;
Ripstra-Turner Co., 1015 E. Douglas St., Wichita, Kan. CA plumbing, heating, ventilating, air-conditioning;
Brown Electric Co., 346 N. Main St., Wichita, Kan. CA electrical work;
Automatic Sprinkler Co. of America, 24 W. 14 St., Kansas City, Mo. CA sprinklers for branch STORE, WICHITA, KAN. Sears, Roebuck & Co., 8 E. Congress St., Chicago, Ill. Total est. cost $3,000,000. Bids July 22. CD 7/9.
Marshall Constr. Co., 4009 Center St., Houston, Tex. CA $309,500. 40,000 sq. ft. WAREHOUSE and alterations, addns. to existing warehouse, Ennis and Velasco Sts., HOUSTON, TEX. Finger Furniture Co., 3131 Calhoun Rd., Houston, Tex. Irving R. Klein & Assoc., 1317 Austin St., Houston, Tex., archts. Walter P. Moore, 2 Pinedale St., and J. Davis, 9240 Kenilworth St., Houston, Tex., engrs. CD 1/22, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **California**—B.A. 9/15—Bureau Reclamation, Dpt. Interior, Tracy, Installing addnl. pumping units in Pumping Plants 1, 2, 3 and 4 Contra Costa Canal,

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Delta District, Central alley Project. Spec. DC 4010. CD 4/20/45.

BIDS ASKED—BUILDINGS

▲ **Wash., Medical Lake**—CRIMINAL WARD—B.A. 9/2—State Dpt. P. Instruction, Olympia, 3 story, rein.-con. criminal ward bldg., Eastern State Hospital with 63x85 ft. rotunda with three 143x31 ft. and one 53x51 ft. wings. $1,100,000. Plans deposit $50. Whitehouse & Price, Hutton Bldg., Spokane, archts. CD 4/1/47.

▲ **Wash., Spokane**—CIVIC AUDITORIUM—B.A. 9/3—City, City Hall, civic auditorium. $2,000,000. Whitehouse & Price, Hutton Bldg., archts. CD 12/1.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Hanson Constr. Co., Enumclaw, Wash., CA, $39,092, est. $39,000, 10,780 ft. 8 and 12 in. c.i. water mains, concrete tank and pumphouse with pump, ENUMCLAW, WASH. City, City Hall, Enumclaw, Wash. P. Scott, superv. of utilities.

† **Mowat Bros. Constr. Co.,** 2833 Eastlake Ave., Seattle, Wash., LB., $611,800, 1 story, 120x300 ft. electronics bldg., for Boeing Airplane Co., SEATTLE, WASH. Dpt. Air Force, The Pentagon Bldg., Wash. 25, D. C. Bids July 30. CD 7/10.

† **Malcolm W. Larson Contg. Co.,** 4080 Galapago St., Denver 16, Colo., LB, $56,218, est $82,617 stringing conductor and overhead wire, Folsom-Elverta 230 KV transmission line Central Valley Proj. Spec. DC 3983, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Folsom, Calif. Bids July 23. CD 7/14.

▲† **Peter Kiewit Sons' Co.,** 442 Post St., San Francisco, Calif. and **Parish Brothers,** Benicia, Calif., CA. $7,628,991, est. $8,155,667, main Monticello Dam, Solono Proj., Yolo, Soloan and Napa Counties, Spec. DC 3970, CALIFORNIA. Bureau Reclamation, Dpt. Interior, City Council Chambers, City Hall, Winters, Calif. Bids July 30. CD 8/4. under LB.

▲† **Stanley H. Ball,** 1101 Westminster Ave., Alhambra, Calif., CA, $1,162,500, airfield pavements, etc., Naval Air Station, NOY 86829, Spec. 37480, MIRAMAR, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids July 24, awarded Aug. 3. CD 7/31, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Macdonald Bldg. Co., 1517 S. Tacoma Way, Tacoma, Wash., CA. $1,104,776, general contract;

Howard Chapman, 2145 South K St., Tacoma, Wash., CA. $349,829, mechanical work, 1 story, part bsmnt., rein.-con., 94,000 sq. ft. CUSTODIAL Bldg., Rainier State School, BUCKLEY, WASH. State Dpt. P. Institutions, Olympia, Wash. Bids July 31. CD 7/10.

▲ **The Pacific Co.,** 801 Cedar St., Berkeley, Calif., CA. $1,669,000, HIGH SCHOOL, ANTIOCH, CALIF. Antioch-Live Oak Unified School Dist., Antioch, Calif. Awarded July 31. CD 12/13/50.

▲ **J. Bettencourt,** 1015 San Mateo Ave., San Bruno, Calif., LB. $1,170,500, combined bids, ACADEMIC bldgs. and Boys' GYMNASIUM, PITTSBURG, CALIF. Pittsburg Unified School District, 250 School St., Pittsburg, Calif. Charles F. Dean, 1521 T St., Sacramento, Calif., archt., for gymnasium, Cantin & Cantin, 704 Market St., San Francisco, archts. for academic bldgs. CD 5/27.

▲ **Robert E. McKee,** P.O. Box 350, Glendale, Calif., CA. $2,875,900, general contract;

Macnsons Contg. Engineers, 151 Tehama St., San Francisco, Calif., CA. $360,287, plumbing work from main INSTITUTION GROUP, California Medical Facility, VACAVILLE, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids July 28. CD 8/5, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., St. Thomas—B.A. 8/28—City, City Hall, sewage disposal plant, $500,000. Plans deposit $50. W. C. Miller, St. Thomas, city engr. Gore & Storrie, 1130 Bay St., Toronto, engrs. CD 1/28.

Alta., Edmonton—B.A. 8/31—City, Civic Block, Edmonton, four lane -950 ft. between abutments with 6 piers deck type continuous girder bridge over North Saskatchewan River. Plans deposit $50. J. D. A. Macdonald, c/o owner, city engr. CD 9/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Lewis Bros. Asphalt Paving Ltd., 131 Bates Rd., Montreal, Que., CA, $66,270 paving various streets, CORNWALL, ONT. Cornwall Twp., 402 Montreal Rd., Cornwall, Ont. L. P. Stidwell, 168 Pitt St., Cornwall, engr. Awarded Aug. 1.

BUILDINGS

LOW BIDS AND CONTRACTS

Branson Hospital, c/o K. L. Graham, archt., 18 Rosemount Ave., Westmount, Montreal, Que., contract not awarded for 2 story, 112x144 ft. main wing and 44 ft. wings, steel frame, brick stone trim HOSPITAL, Finch Ave. in Suburban, TORONTO, ONT. (Correction-status). CD 7/29, under CA.

▲ **Ball Brothers Ltd.,** 49 King St. E., Kitchener, Ont., CA, $1,250,000, 2 story, bsmnt. OFFICE, in John St. W. area, head-office bldg., WATERLOO, ONT. Dominion Life Assurance Co., Albert St., Waterloo, Ont. Bids July 27, awarded Aug. 4. CD 7/23.

▲ **Bird Constr. Co. Ltd.** 7 and Smith Sts., Regina, Sask., CA, Est. $2,000,000, superstructure and foundation 4 story, 260,000 sq. ft., WAREHOUSE addn.,

DESIGNED TO MEET YOUR SPECIFIC NEEDS

The Taller & Cooper installation at Sandy Point Park, Maryland, includes axle-counting treadle, fare indicator, traffic signals and remote recorder . . . assuring efficient traffic control and dependable protection of revenues.

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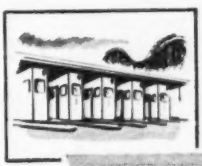
PREFABRICATED
ENTRANCE & COLLECTION BOOTHS



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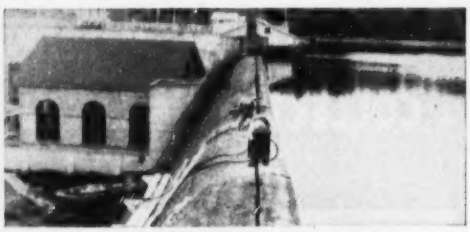
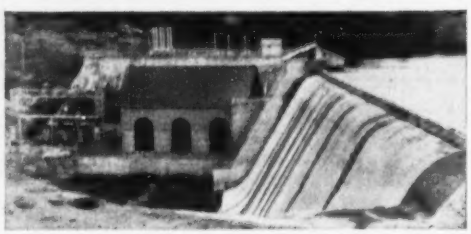
CONCRETE GRINDING CORP.
300 STRAIGHT ST. PATERSON, N. J.

CEMENT GUN Co. RESTORES DAM with "GUNITE"





The photographs, at left, show a large Ambursen type dam in Northern New England which has been reintegrated with "GUNITE."

The top photograph shows the spalled and eroded condition of the concrete when the Cement Gun Company crews arrived on the job. The surface was chipped back to sound concrete and reinforcing mesh applied. Then the entire downstream surface was blanketed with "GUNITE."

The bottom photograph shows the completed "GUNITE" surfacing of the dam.

This is typical of many dams which we have restored throughout the country. Many similar examples of repair, remodeling and new construction with "GUNITE" are described and pictured in Bulletin A2400. A request on your letterhead will bring a free copy by return mail.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.

MANUFACTURERS OF THE CEMENT GUN

60,000 sq. ft. office floor over existing 1 story warehouse, Broad St. N., REGINA, SASK. Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont. Van Egmond & Storey, McCallum Hill Bldg., Regina, Sask., archts. Awarded July 31. CD 3/13.

▲ **Campbell Chibougamau Mines Ltd.**, 625 W. Dorchester St., Montreal, Que., Own Forces, $7,000,000. processing PLANT, CHIBOUGAMAU, QUE. Genevae Eng. Co. Ltd., 100 W. Adelaide St., Toronto, Ont., consult. engrs. CD 7/9.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **C. Quisberg**, Anchorage, Alaska. LB $62,650, est. $48,351. AACS facilities, Elmendorf Air Force Base and Naknek, Schedule 4, Inv. 53-79, ALASKA. U. S. Eng., Anchorage, Alaska. Bids July 29. CD 7/22.

BUILDINGS

LOW BIDS AND CONTRACTS

† **Anchorage Builders and Kincaid & King**, Anchorage, Alaska. LB $459,892. est. $360,565. 1 story, 14,500 sq. ft. DISPENSARY and DENTAL CLINIC with outside utilities, ENG-95-507-54-11, FORT RICHARDSON, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Aug. 4. CD 7/15.

PUERTO RICO

BIDS ASKED—BUILDINGS

Puerto Rico, Santurce—OFFICE—B.A. 8/31—Puerto Rico Water Resources Auth., Credito y. Ahorro Bldg., San Juan, 7 story office, $500,000. Plans deposit $100. Extended date. CD 7/16.

Proposed Projects

WATER SUPPLY

▲ **Ind., Indianapolis**—Indianapolis Water Co., 113 Monument Circle, Zone 4, Cicero Creek to be dammed for Reservoir (lake 7 mi. long, from ¼ mi. to 1 mi. wide), incl. site clearing, relocation of roads and bridges, power and oil lines, near Noblesville. $6,000,000. Lewis S. Finch, 1260 Speedway Ave., Zone 2, ch. engr. CD 4/18/49.

Mo., Sugar Creek—City, c/o John Gavin, clk., voted $145,000 bonds July 28, WW, $225,000. CD 7/16.

Neb., Oakland—City, defeated $140,000 bonds water supply imprvs. CD 7/16.

O., Eastlake—City, City Hall, bond election November 3, 16-in. water main, Lakeland Blvd. from westerly city limits east to existing distr. sys. $200,000.

Wash., Hoquiam—City, City Hall, 7 mi. 27 in. rein.-con. supply line from Davis Creek, $670,000; log crib dam on Davis Creek, $35,000; pumping and chlorination station, $26,000. Parker, Hill & Ingman, 1728 E. Madison St., Seattle, consult. engrs. CD 6/26/47.

Alaska, Anchorage—City, City Hall, bond election Sept. 1, water main imprvs., downtown, $500,000; exten. to Spenard, $300,000.

SEWERS, WASTE DISPOSAL

Calif., Fillmore—City, 345 Central Ave., $600,000 bond election Sept. 15, sewage treatment plant, sanitary sewers. Hostrup, Lyons & Assoc., 9526 W. Pico Blvd., Los Angeles, consult. engrs. CD 6/5.

Calif., Rio Vista—City, City Hall, voted $310,000 bonds, sewage collection and treatment; $40,000 bonds for storm drainage imprvs.

▲ **Fla., Jacksonville**—City Commission Committee, City Hall, sent invitations today to four nationally known engineering firms to submit sealed proposals by September 1st for preparing a master plan for sewers and drains for metropolitan Jacksonville. The firms selected were: Metcalf & Eddy, 1300 Statler Bldg., Boston 16, Mass., Greeley & Hansen, 220 S. State St., Chicago 4, Ill., Havens & Emerson, Woolworth Bldg., New York 7, N. Y. and Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York 6, N. Y. $2,000,000. CD 8/3.

Ill., Downers Grove—Downers Grove Sanitary District, Downers Grove, voted $900,000 bonds sewage treatment works and sewers. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, Zone 11, consult. engrs.

▲ **Ind., Indianapolis**—Bd. Sanitation, Clarence Drayer, chn., City Hall, Zone 4, main plant, Eagle Woods south of here, one 450 ton crane bin type garbage and sludge disposal plant, $1,600,000; sludge equipment $1,750,000; two 300 ton crane bin type garbage and trash disposal incinerator, N.E. and N.W. sections of city, $2,200,000. Moore & Heger, 810 N. New Jersey St., Zone 4, consult. engrs. CD 10/15/43.

Minn., Hopkins—City, W. Taylor, mgr., voted $200,000 bonds July 28, storm sewer. F. Laska, city engr. CD 7/22.

Mo., Ozark—City, voted $125,000 bonds July 17, sewers, sewage plant, $142,000, Russell & Axon, 408 Olive St., St. Louis, consult. engrs. CD 7/27.

Mo., University City (St. Louis 5 P. O.)—City, Francis C. Flynn, clk., City Hall, 6801 Delmar Blvd., combined storm and foul water sewer in Sewer Dist. No. 76, manholes, inlets, etc., $207,305. CD 3/5/51.

(Continued on page 141)

Gradall Makes News in Houston

Here is a full page feature story from the Houston, Texas Sunday Chronicle. In it Staff Writer Dick Tate reports his interview with Mr. H. C. Hord, Superintendent of Houston's City Street Repair Division. Mr. Hord's enthusiastic approval of the Gradall, plus the fact that the city owns six of these multi-purpose machines, shows that the Gradall is cutting costs and winning supporters in Houston!

Ready to take a bite, this new "almost human" ditch digging machine is one of several acquired by Houston recently. Operators like C. M. Roberts can control the bucket's bite within an inch.

Photos by Stan Bogan.

Ditch Diggin' Demon

Street Repair Division Proud Of New, Versatile Equipment

BY DICK TATE
Staff Writer

"JUST STRAP a razor on the bucket and I'll shave you with it."

That's what Superintendent H. C. Hord, city street repair division, thinks of the new street repair equipment recently acquired.

Actually the machines (the city bought six) are used for ditch cleaning and digging as well as other street repair chores. But they are so delicately controlled that they are almost human in some respects.

Mounted on trucks, they are a sort of junior-sized dragline. However, they are equipped with precision controls that enable the operators to perform hair-splitting feats impossible with heavier and more cumbersome draglines, Mr. Hord said.

The digging or bucket end is hydraulically controlled with a "wristlike" action which allows the operator to shape ditches or dig excavations within an inch or less of the desired grade.

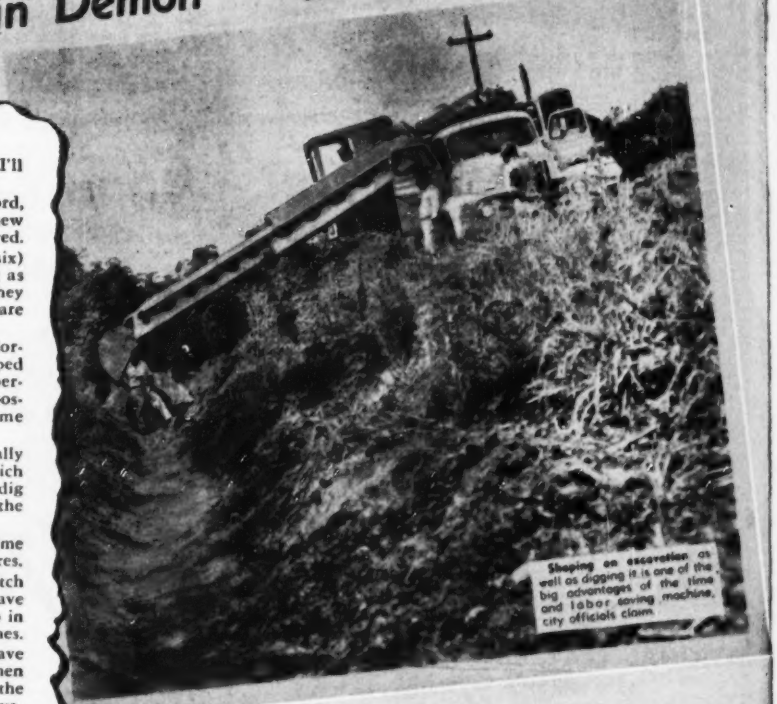
"With a dragline you are lucky to come within six inches of grade," Mr. Hord declares.

The machines are used not only for ditch digging and cleaning on which jobs they have proven to be a great labor saver, but also in digging trenches for sewer and water lines.

On both jobs, however, they not only save man power, but time as well. A crew of men working on ditches or trenches digs out the dirt, then tosses it on the side of the excavation, then has to pick it up later from that point and load it into trucks, Mr. Hord said.

"The new machines pick it out of the ditch—shape the excavation while doing it and toss it into a waiting truck—all in one sweep," he added.

"We haven't tried it yet, but I'm sure I could pick up a glass of water with it and hand the glass to you without spilling a drop," Mr. Hord said with a grin.



Shaping an excavation as well as digging it is one of the big advantages of the time and labor saving machine, city officials claim.

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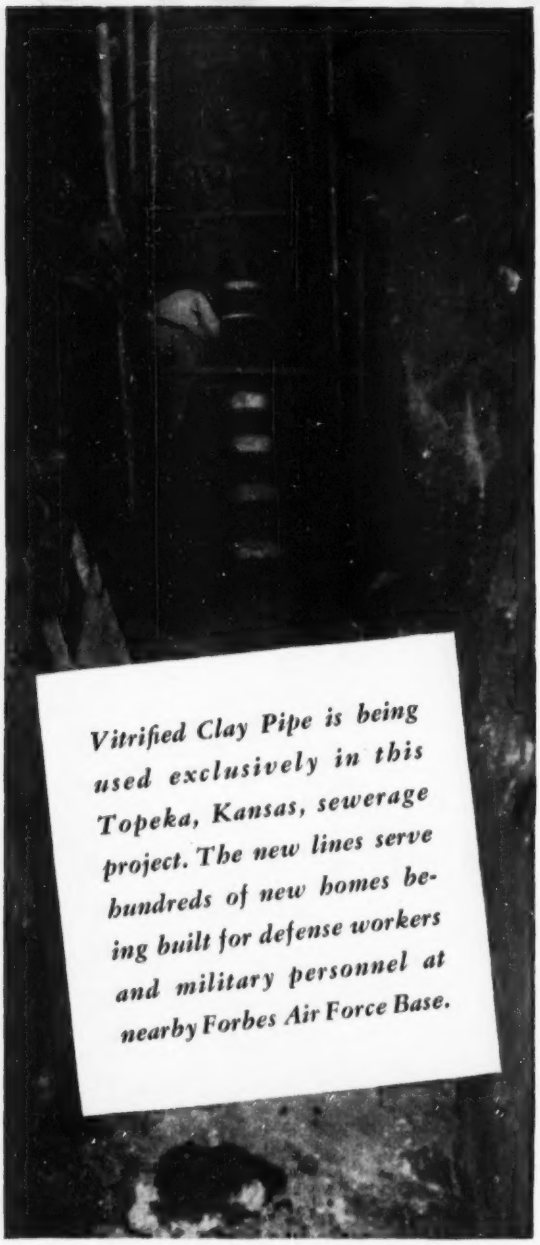
Topeka Specifies Vitrified Clay Pipe

For $175,653 Defense Housing Sewer Project


Vitrified Clay Pipe is being used exclusively in this Topeka, Kansas, sewerage project. The new lines serve hundreds of new homes being built for defense workers and military personnel at nearby Forbes Air Force Base.

As a rapidly growing critical defense area, Topeka, Kansas, has a double sewerage problem. First, it must provide immediate sewerage facilities for hundreds of new homes. And second, it must make sure those new sewer lines are permanently corrosion-proof — because they serve an area that is slated for industrial expansion. The Topeka City Commission is solving both of these problems by specifying Vitrified Clay Pipe.

Regardless of the strong home detergents or industrial wastes that may flow through the lines—today or a hundred years from now —Clay Pipe is *sure* to last. Acids and gases can't corrode it . . . time can't weaken it. Clay Pipe is backed by a 50-year guarantee.

When you specify or install sewer lines, don't take chances — use Vitrified Clay Pipe. *It never wears out!*

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ESSENTIAL • ECONOMICAL • EVERLASTING

Vitrified
CLAY
CLAY PIPE NEVER WEARS OUT!
PIPE

(Continued from page 138)

Okla., Ponca City—City, City Hall, sewage disposal plant, $400,000. F. A. Winstead, c/o owner, engr. CD 3/28/51.

Tex., Almeda—Mrs. Toy Lee Stickle, Wright Bldg., Oklahoma City, Okla., storm sewers, $95,000; sanitary sewerage sys., $100,000, 300 acres of 1074 homesites, S. Post Oak Rd. terminus and Anderson Rd. E. S. & Robt. M. Atkinson, First National Bank Bldg., Houston, consult. engrs.

Tex., Houston—Mrs. Ida L. Atwood, 5500 Westheimer St., storm sewers, $60,000; sanitary sewers, $65,000.

Tex., Houston—Jimmy Demaret & Jackie Burke, 3621 Fannin St., storm sewers, drainage, $62,500; sanitary sewers, $60,000, off Katy Rd. Hilton & Coulson, 3821 Fannin St., consult. engrs.

Tex., Houston—R. L. Hancock, Henrietta, storm sewers, $60,000; sanitary sewers, $65,000, 221 acre tract Cypres, North Houston Rd.

Tex., Lake Jackson—E. F. Philip Constr. Co., 4678 Telephone Rd., Houston, drainage, storm lines, $60,000; sanitary sewer collection lines, $66,500, in area off Parkwood Terrace.

Tex., San Antonio—Quincy Lee Constr. Co., 211 Olmos Dr. W., storm sewers, $60,000; sanitary sewers, $65,000.

Tex., Texas City—Town, rehabilitation and exten. sanitary sewerage sys., $125,000; storm sewers and drainage. $70,000.

Alaska, Anchorage—City, City Hall, $150,000 bond election Sept. 1, sewer installations,

BRIDGES

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Okla.,

Carter Co.—bridge over Washita River on Hy. 18, Durwood, $175,000.

Okmulgee Co.—bridge over Deep Fork on U. S. 62, Okmulgee, $75,000. G. H. Bittle, c/o owner, engr.

Texas and Mexico—Syndicate, c/o Frank Perez, chn. of proj., Mission, Tex., international pedestrian vehicle bridge across Rio Grande River between Mission, Tex. and Los Abanos, Mex. $300,000. Weldon Appelt, Aztec Bldg., San Antonio, Tex., consult. engr.

Wash., Mount Vernon—Skagit Co., Court House, 248 ft. plate-girder swing span with 109 ft. prestressed concrete approaches at each end of Swinomish Slough at LaConner, $400,000. H. Powell, Smith Tower, Seattle, Zone 4, consult. engr. H. O. Wahlberg, co. engr.

▲ ONTARIO—Dpt. Highways, Parliament Bldgs., Toronto Burlington—new high level bridge across Burlington ship canal, clearance 120 ft. for ships high-level bridge section 8,466 ft., entire project with approaches 4.375 mi. part of Queen Elizabeth Hy. $16,000,000. CD 4/28/49.

STREETS AND ROADS

▲ KANSAS—Kansas Turnpike Auth., Wichita, has employed Howard, Needles, Tammen & Bergendoff, engrs., 921 Walnut St., Kansas City, Mo. to make cost survey on the toll road from north border of Oklahoma through Wichita, Kan. to Kansas City approx. 240 mi. $110,000,000.

Mich., Pontiac—Bd. Rd. Comrs. Oakland Co., 550 S. Telegraph Rd., wid'n. Orchard Lake Rd. from 16 to 22 ft. from 11 Mile to 14 Mile Rd., $150,000. CD 1/12.

Tex., Almeda—Mrs. Toy Lee Stickle, Wright Bldg., Oklahoma City, Okla., paving streets, roads, $110,000, 300 acres of 1074 homesites at S. Post Oak Rd. terminus and Anderson Rd. E. S. & Robt. M. Atkinson, First National Bank Bldg., Houston, consult. engrs.

Tex., Texas City—Town, street imprvs., paving some new streets, $100,000.

▲ VIRGINIA—State Dpt. Hys., 1221 E. Broad St., Richmond, recommended that the General Assembly create a special authority to construct 36 mi. toll road from Richmond to Petersburg, would begin near the convergence of U. S. Rtes. 1 and 301 just north of Richmond, cut through the city on a still tentative route, go south across James River on bridge authority would build, then continue parallel to and just east of present U. S. Rte 1 through Colonial Heights across the Appomattox River on another new bridge and through Petersburg to link with Rte. 301. $57,000,000, Wilbur Smith & Assoc., Box 183, Saugatuck Station, Westport, Conn., engineering consultants made study of area. Plan for private toll road has been rejected. CD 2/18.

▲ Wash., Pasco—Franklin Co., Courthouse, Pasco, 90 mi. arterials $1,350,000 and 210 mi. feeder roads $1,575,000 to serve 119,000 acres of Columbia Basin Irrigation project, H. R. Blanton, co. engr.

Wash., Seattle—King Co., County-City Bldg., Zone 4, reconstr. and widening road between White Center and Burien, $250,000. D. L. Evans, Co. engr.

▲† Alaska—Alaska Road Comn., Dpt. Interior, Juneau, imprv. Cordova-Richardson Hy. $2,400,000.

EARTHWORK, WATERWAYS

Calif., Redding—Shasta Dam Public Utility District, Redding, $200,000 bond election Aug. 25, water mains, electric power line and 220,000 gal. water tank. CD 8/29/45.

Tex., Nacogdoches—Nacogdoches Co. Water Conservation Proj., c/o J. Elbert Reese, water conservation proj., dam, etc. $300,000.

Ont., Wallaceburg—Dpt. P. Wks., Hunter Bldg., Ottawa, dredging in Snye Channel and Sydenham river, eliminating sharp curves in channel passage of freight boats to Wallaceburg, $500,000.

AIRPORTS

Del., New Castle—TERMINAL, etc.—New Castle Co. Levy Court Airport, New Castle, plans by W. Ellis Preston, 903 Jefferson St., Wilmington, terminal and administration bldg., County Airport, $550,000. CD 7/31/47.

▲ † R. I., Quonset Point—TESTING FACILITIES—First Naval District, 495 Summer St., Boston, Mass., jet plane testing facilities, etc. Quonset Point Naval Air Station, $2,300,000. CD 10/31/51.

LATIN AMERICA

▲ Mexico, Nuevo Laredo—Nuevo Laredo Federal Irrigation Dist., c/o D. P. Diaz, Nuevo Laredo, irrigation canals, will extend from Ciudad Acuna, across river from Del Rio, Tex. to Falcon Dam, 75 mi. below Laredo, Tex. $750,000; irrigation water pumping unit, $250,000.

PUBLIC BUILDINGS

▲ Calif., San Diego—SCHOOL—San Diego Unified School Dist., Park and El Cajon Blvds., plans by Herluf Brydegaard, 423 Date St., 112,000 sq. ft. Junior High School, Clairmont and Ute Sts. $2,000,000. CD 5/1.

▲ Calif., West Covina—SCHOOL—West Covina School Dist., 821 S. Sunset Ave., $3,392,000 bond election Oct. 16, schools. CD 6/23.

▲ Colo., Aurora—SCHOOL—School District No. 28-J, 1225 Kenton St., bond election Sept. 15, high school between 10 and 11 Aves. and Newark and Peoria Sts. $1,500,000. Atchison & Koverstrom, 1254 Monaco Parkway, Denver, consult. engrs. and archts. CD 8/3.

Conn., New Haven—SCHOOL—City Bd. Educ., 169 Church St., plans by Westcott & Mapes, Inc., 109 Church St., Betsey Ross School, $800,000.

▲ Ia., Fort Dodge—SCHOOLS—Bd. Educ., Fort Dodge, two schools, $1,600,000. CD 12/12/47.

Me., Lewiston—SCHOOL—City, A. Alden Woodworth, supt. Schools, City Hall, plans by Stanley S. Merrill, 9 Vine St., Auburn, high school addn. $500,000. CD 10/4/45.

▲ Mich., Utica—SCHOOL—Bd. Educ., Utica School Dist., voted $1,000,000 bonds, high school.

▲ Minn., Minneapolis—SCHOOL—Bd. Educ., 807 Broadway N. E., Junior High School between Girard and Irving Aves. South and 55 and 56 Sts. $1,000,000, E. H. Enger, c/o Owner, archt.-engr.

▲ N. J., Arneytown—STATE PRISON—State Div. Purchase & Property, State House, Trenton, plans by Kelly & Gruzen, 744 Broad St., Newark, and Jesse Shelton, assoc. archt., 96 Poplar St. N. W., Atlanta, Ga., state prison $12,500,000. CD 2/20, under N. J., Trenton.

▲ N. J., Salem—SCHOOL—Bd. Educ., Salem, plans by Hettel & Albert, 501 Cooper St., Camden, elementary school. $1,000,000.

▲ N. J., Seabrook—SCHOOL—Upper Deerfield Twp. Bd. Educ. Seabrook, elementary school, $1,000,000.

▲ N. J, Trenton—FOOD SERVICE BLDG., DORMITORY—New Jersey State Bldg. Auth., State House, Trenton, plans by Jay C. Van Nuys, 1 W. Main St., Somerville, food service bldg. and dormitory, State Teachers College at Hillwood Lakes. $1,500,000. CD 3/27/52.

O., Bedford—SCHOOLS—Bd. Educ., Bedford, bond election September 22, new elementary school, addnl. work at high school now under constr. $800,000. Bond election date changed. CD 7/2.

O., Maumee—SCHOOLS—Bd. Educ., Jos. L. Baird, supt., 12 room school serve north and east sections, $500,000; high school alterations, $350,000.

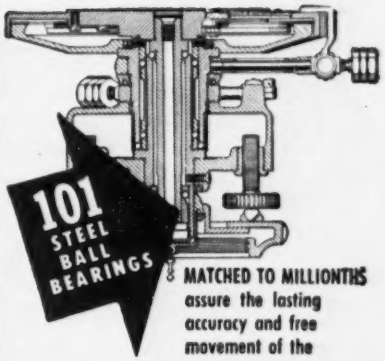
▲ O., Newark—ARMORY, etc.—Adjutant General of Ohio, 530 Buckingham St., Columbus, national guard armory for heavy motor maintenance, $3,500,000; heavy motor maintenance shop on site of present national guard warehouse, $3,500,000.

▲ O., Parma—SCHOOLS—Bd. Educ., Parma, will resubmit a $3,500,000 bond election November 3 for school addns. and imprvs. This bond issue was approved May 5, but was found to have been inadequately advertised. CD 5/11.

▲ O., Toledo—SCHOOLS—Bd. Educ., Linwood and Southard Ave., grade school near northwest boundary of DeVeaux School Dist., $445,350; grade school northwest part of McKinley Dist., $584,250; grade school, site in Larchmont gardens, $524,250; Old Orchard School addn., $606,300; To be financed by 2-mill levy to be submitted to voters Nov. 3. CD 12/11.

▲ Pa., Ardmore—SCHOOL—Lower Merion Twp. School District, Ardmore, plans by David Supowitz, 246 S. 15 St., Phila., elementary school in Gladwyne Section, $1,000,000. CD 6/23.

▲ Pa., Harrisburg—OFFICE, etc.—General State Auth., 18 and Herr Sts., Harrisburg, state office in vicinity of Capital and Forster Sts., $6,500,000; rehabilitation center at Harrisburg for State Department of Labor and Industry. $1,600,000. A. F. Jones, c/o owner, ch. engr.



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TANKS • TOWERS • VESSELS
CYLINDERS

Pa., Library—SCHOOL—School District of Snowden Twp., Library, plans by Pres. C. Dowler, Century Bldg., Pittsburgh, Junior-Senior High School, Snowden Twp. $550,000

▲ **Pa., Phila.**—COMMERCIAL MUSEUM—Dpt. Procurement, City Hall Annex, plans by Oscar G. Stonorov, 1621 Chestnut St., commercial museum modernization and imprvs. $1,680,000.

▲ **Pa., Phila.**—HOSPITAL IMPRVS.—General State Auth., 18 and Herr Sts., Harrisburg, imprvs. at Lankenau State Hospital. $2,000,000. A. F. Jones, c/o owner, ch. engr.

▲ **Pa., Phila.**—OFFICE—General State Auth., 18 and Herr Sts., Harrisburg, state office bldg. $8,000,000. A. F. Jones, c/o owner, ch. engr. CD 12/1/49.

▲ **Pa., Pittsburgh**—OFFICE—General State Auth., 18 and Herr Sts., Harrisburg, state office bldg. $6,500,000. A. F. Jones, c/o owner, ch. engr.

▲ **Pa., Rural Valley**—SCHOOL—Joint School District of Rural Valley & Cowanshannock Twp., Rural Valley, plans by James K. Scheeren, 413 Indian State Theater, Indiana, brick, block junior-senior high school $550,000.

Pa., Quakertown—SCHOOL—Quakertown-Tohicken Twp. School, Quakertown, high school, $750,000. CD 3/30/50.

▲ **Pa., State College**—STUDENT HEALTH CENTER, etc.—General State Auth., 18 and Herr Sts., Harrisburg, student health center, $1,000,000; general classroom bldg., $1,500,000; military, air and naval science bldg., $1,500,000, for Pennsylvania State College. A. F. Jones, c/o owner, ch. engr. CD 12/20/49.

Pa., West Mifflin—SCHOOL—Bd. Educ., West Mifflin, Pittsburgh, plans by Button & McLean, 119 Montgomery St. N.S., Pittsburgh, 1 story, 85x340 ft., brick, block Homeville Grade School, $800,000. CD 11/20/50.

▲ † **R. I., Newport**—STORAGE, etc.—First Naval District, 495 Summer St., Boston, Mass., storage and cargo facilities, Newport Naval Supply Depot. $2,600,000.

▲ **Tex., Waco**—SCHOOLS—Waco Independent School Dist., plans by Harris H. Roberts & Assoc., 1103 Medical Arts Bldg., and Gustav R. Olson, coord. archt., Box 27, Waco, Westside Elementary School, 42 and Proctor Sts., $325,000; Southside Elementary School, North 7 St., $300,000; Elementary School No. 1, Brock Ave., $550,000; Elementary School No. 2, Gurley Ave., $650,000. CD 5/1.

Wash., Vancouver—SCHOOL—Vancouver School District, Vancouver, plans by Stewart & Richardson, Central Bldg., high school $800,000. CD 12/23.

Que., Verdun—SCHOOL—Verdun Catholic School Comn., R. Roy, secy., plans by A. Dutrisac, Verdun, French-language high school for boys, called "Ecole Superieure Notre-Dame", $650,090. CD 10/21/51.

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HEAVY-DUTY Air-Cooled ENGINE POWER

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More than 500 manufacturers of engine-powered equipment of all kinds, including many time- and labor-saving machines designed for most efficient, dependable farm service, specify WISCONSIN Heavy-Duty Air-Cooled Engines as "original equipment".

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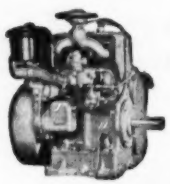
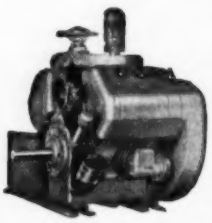
Specify Wisconsin Heavy-Duty Air-Cooled Engines for your equipment for "Most H.P. Hours" of on-the-job service, economical operation and low-cost maintenance.

4-cycle single-cylinder 3 to 9 hp.



2-cylinder 7 to 14½ hp.



V-type 4-cylinder 15 to 36 hp.

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COMMERCIAL BUILDINGS

Calif., Los Angeles—DWELLINGS—Apex Constr. Co., 239 S. Robertson Blvd., Beverly Hills, plans by Emery Kalnarik, 140 N. La Brea Ave., 58 frame, stucco dwellings in Van Nuys district. $500,000.

▲ **Del., Newark**—SHOPPING CENTER—Pomeroy Realty Inc., 1200 15 St. N.W., Wash., D. C., plans by J. Eldredge Moxley & Son, 12 E. 24 St., Baltimore, Md., shopping center, incl. 25 stores, parking area, $1,000,000.

▲ **Del., Wilmington**—OFFICE—Atlas Powder Co., Delaware Trust Bldg., Wilmington, plans by G. Morris Whiteside 2nd, 909 Tatnall St., office, $2,500,000. CD 2/4.

▲ **Md., Baltimore**—OFFICE—Commercial Credit Co., First National Bank Bldg., plans by Harrison & Abramovitz, 630 Fifth Ave., New York, N. Y., office, est. $8,000,000. CD 7/27.

Mass., Boston—OFFICE—H. N. Gorin & Leeder Management Co., 318 Harvard St., Brookline, plans by Harman L. Freer & William E. Nast, 27 School St., office addn., 10 Post Office Square. $600,000-$700,000.

Mich., St. Joseph—CHURCH—First Congregational Parish, St. Joseph, plans by J. & G. Daverman Co., 924 Grandville St., Grand Rapids, 1 story, bsmnt., brick, stone church. $475,000.

▲ **Minn., Crystal**—SHOPPING CENTER—Willow Bend Co., O. P. Jones, secy., Crystal, plans by Lang & Raugland, 802 Wesley Temple Bldg., Minneapolis, 150,000 sq. ft. shopping center, incl. 25 stores. $2,000,000.

▲ **Mo., Kansas City**—HOMES—Mackintosh Investment Co., R. H. Mackintosh, vice pres., Mission, Kan., plans by Hare & Hare, devel. archt., 114 W. 10 St., Kansas City, Mo., Glen Arbor Gardens, 100 home site development, 112 and Wornall Rds. $1,800,000.

▲ **Mo., Sedalia**—HOUSING—Bloesser Building Co., Crawford Bldg., Topeka, Kan., housing development country club addn., Woodlawn addn. $1,000,000.

Neb., Lincoln—OFFICE—Arthur J. Weaver & A. L. (Pat) Minier, 324 Sharp Bldg., plans by Solheim-Treadway Assocs., 324 Sharp Bldg., office. $500,000.

▲ **N. Y., New York**—OFFICE—Knickerbocker Development Co., Leonard J. Beck, pres., 14 W. 48 St., New York, 35 story, office, Avenue of Americas, 51 and 52 Sts. $15,000,000.

▲ **O., Zanesville** — HOSPITAL — Bd. Trustees Good Samaritan Hospital, 1247 Ashland Ave., hospital addn. $1,500,000.

▲ **Pa., Phila.**—HOTEL—Bankers Security Corp., 1325 Walnut St., alterations, modernization incl. air-conditioning Benjamin Franklin Hotel. $2,500,000.

▲ **Pa., Phila.**—STORE—W. T. Grant Co., 130 W. 42 St., New York, N. Y., plans by Thalheimer & Weitz, 1315 Walnut St., department store. $1,000,000. CD 8/10/44.

▲ **Tex., Conroe**—HOTEL—Community Hotel, c/o W. B. Weisinger, chn. Bldg. Com., Conroe, plans by Stone & Pitts, 1872 Goodhue St., Beaumont, ultra-modern hotel, 3-acre tract, intersection Hys. 75 and 105. $1,500,000. CD 7/18/52.

Tex., Dallas — CONVENT — St. Matthews Cathedral-Episcopal, 5100 Ross St., convent NE of Coit and Valley View Sts. $400,000.

▲ **Tex., Houston**—DWELLINGS—Mrs. Ida L. Atwood, 5500 Westheimer St., Unit 1, fourteen 1 and 2 story, masonry dwellings, $300,000; Unit 2, 20 dwellings, $400,000; Unit 3, 12 dwellings, $300,000; Unit 4, 23 dwellings, $475,000; Unit 5, 18 dwellings, $365,000; Unit 6, 11 dwellings, $315,000, on site adjacent to Afton Oaks.

▲ **Tex., Houston**—DWELLINGS—Bayou Cities Properties, c/o Fred McManis, Jr., vice pres., 1200 Old Spanish Trail, ten 2 story, masonry dwellings, air-conditioning, $345,000; 18 masonry dwellings, $390,000; 15 frame, masonry dwellings, air-conditioning, $350,000, Belfort Drive exten., near here.

Tex., Houston—DWELLINGS—Jimmy Demaret & Jackie Burke, (National Golfers) 3821 Fannin St., 21 brick dwellings, concrete slab fdn., $300,000; 25 frame, brick dwellings, concrete slab fdn., $375,000; 18 brick, stone dwellings, concrete slab fdn., $315,000, off Katy Road.

▲ **Tex., Lake Jackson**—DWELLINGS—E. F. Fillip Constr. Co., 4678 Telephone Rd., Houston, Phase No. 1, 50 dwellings, $395,000; Phase No. 2, 40 dwellings, $330,000; Phase No. 3, 36 dwellings, $300,000; Phase No. 4, 46 dwellings, $380,000, off Parkwood Terrace.

Tex., San Antonio—DWELLINGS—Quincy Lee Constr. Co., 211 Olmos Dr., W., 38 frame, masonry dwellings, $325,000; 34 frame, masonry dwellings, $300,000.

▲ **W. Va., Weirton**—SCHOOL—Central Catholic High School, Weirton, plans by C. J. Kelin, c/o Weirton Steel, Weirton, 2 story, 65x150x265 ft. L-shaped brick, steel high school. $1,000,000.

▲ **Ont., Ottawa**—SUPERMARKET—Loblaw's Groceterias Co. Ltd., foot of Bathurst St., Toronto, supermarket at south side of city in Billings Bridge area, parking area, etc. $1,000,000.

▲ **Ont., Toronto**—APARTMENT HOTEL—Seaways Apartment Hotel Co., c/o Louis W. Epstein, Sunnyside

(Continued on page 144)

TRAILMOBILE trailers can help speed a TIGHT CONSTRUCTION SCHEDULE!

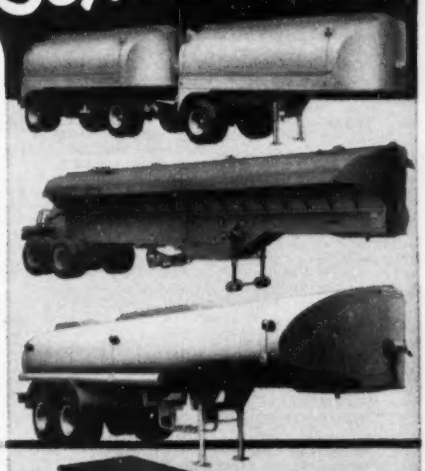
USE THIS TRAILMOBILE CHECK LIST

- ☐ Water
- ☐ Gasoline
- ☐ Kerosene
- ☐ Asphalt
- ☐ Bulk Cement
- ☐ Aggregate
- ☐ L.P. Gas

Trailmobile can provide any of the following tank trailers—for water, gasoline, oil, butane and kerosene in specific sizes.

This 115-barrel bulk cement trailer can be emptied in 15 minutes with positive step-down screw discharge unloading—saves packaging and handling of bags.

Asphalt trailers, with or without heating units—to legal capacity.



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- ☐ Piping
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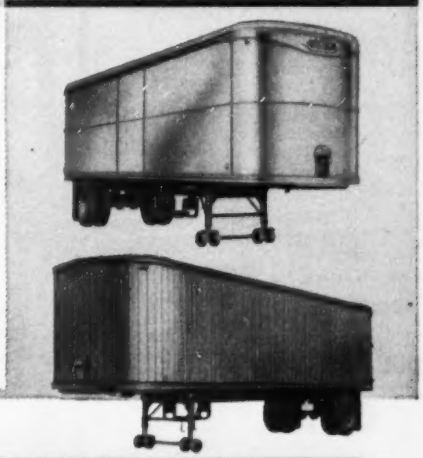
- ☐ Concentrated Weights and Loads
- ☐ Lumber

Trailmobile flat beds are available in almost any length and capacity, for on-and-off highway use. Famous Trailmobile Tandem suspension makes them "easy" rolling and long lasting.

- ☐ Miscellaneous Equipment
- ☐ Loose Freight and Cargo
- ☐ Electrical Equipment
- ☐ Explosives and Delicate Instruments
- ☐ Tools
- ☐ Mobile Field Office

Available in either steel or aluminum, single or tandem axles—and in sizes from 18′ to 42′. All new Trailmobile designs are Electronically Tested. Units are designed for minimum maintenance and long, hard service. These Trailmobile vans can handle all your bulk and miscellaneous equipment.



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PULLMAN INCORPORATED

TRAILMOBILE INC.

CINCINNATI 9, OHIO **BERKELEY 10, CALIFORNIA**

Friendly Sales and Service from Coast to Coast

(Continued from page 142)
Motor Hotel, plans by Mathers & Haldenby, 15 St. Mary St., 4 story, 120-room apartment hotel, Toronto Lakeshore alongside motor hotel. $1,000,000.

INDUSTRIAL BUILDINGS

▲ **Ark., Crossett**—PAPER MILL—Crossett Lumber Co., P. F. Watsek, pres., Crossett, paper mill west of present kraft mill. $20,000,000. J. E. Sirrine & Co., 215 S. Main St., Greenville, S. C., consult. engrs. CD 8/3.

Ark., Mena—PLANT—Mylan Mfg. Co., Inc., 350 Fifth Ave., New York, N. Y., shirt plant, $180,000.

▲ **Del., Seaford**—PLANT—Southern States Co-operative, Inc., 2101 E. Ford Ave., Baltimore, Md., feed milling plant. $1,000,000. S. J. Beyham, c/o owner, engr.

Del., Wilmington—PARKING—Lester Aarons & Arthur Kravits, 617 Shipley St., auto parking bldg. $500,000.

Fla., Jacksonville—PLANT—Maxwell House Coffee, 250 Park Ave., New York, N. Y. coffee processing plant, 735 E. Bay St. $100,000.

Ind., Centerville—PLANT—Gulf Refining Co., 114 W. St. Clair St., Indianapolis, Zone 6, bulk storage plant. $100,000 or more.

Mo., Kirksville—PLANT—Civic Development Organization, Kirksville, plant. $200,000. McGraw Electric Co., 5201 W. 65 St., Chicago, Ill., lessee.

Neb., Omaha—WAREHOUSE—Graybar Electric Co., 1120 Capitol Ave., Omaha, plans by J. E. Loftus, Omaha National Bank Bldg., warehouse. $260,000.

N. Y., Binghamton—WAREHOUSE—McTighle Grocery Co. Inc., 7 N. Depot St., 1 story, approx. 30,000 sq. ft. masonry, structural steel warehouse, $100,000. M. Ward Easby, Inc., 1201 Chestnut St., Phila., Pa., consult. engr.

Pa., Hatboro—PLANT, etc.—Air-Shields, Inc., Hatboro, plans by Kneedler, Murick & Zantzinger, 12 S. 12 St., Phila., plant, laboratories, offices. $250,000.

Pa., Phila.—TERMINAL, etc.—Trans-American Properties, Inc., 800 N. Delaware Ave., motor freight terminal, garage and office. $500,000.

Pa., Upper Darby—SALES, SERVICE, etc.—Dave Reese Olds, Inc., 4020 Locust St., Phila., plans by Clifford E. Garner, 10 S. 18 St., Phila., auto sales, service and garage. $175,000.

Tex., Alba—MINING—Consumers Lignite Co., Alba, rehabilitation, remodeling lignite mining project. $250,000.

Tex., Amarillo—SERVICE STATION—H. M. & B. E. Southworth, Amarillo, plans by O. L. Johns, Amarillo Bldg., masonry super service station. $100,000.

Tex., Aspermont—PLANT—Stonewall Gas Products Inc., Aspermont, plant imprvs., $768,000; storage, $118,000, near here.

Tex., Benavides—PLANT—Goliad Corp., c/o Harry Bass, pres., Magnolia Bldg., Dallas, Liquid Hydrocarbons Extraction Plant No. 2, near here. $850,000.

Tex., Houston—PLANT—Consolidated Venetian Blind Co., 2401 Nicholson St., plant expansion. $100,000.

Tex., Houston—AUTO SALES, and SERVICE SHOP—Finnigan Estates, First National Bank Bldg., plans by Cook & Holle, 4219 Yoakum St., 2 story, 100x250 ft. auto sales, service, shop, outside ramp, 110x100 ft. paved parking area, air-conditioning, Main and McGowan Sts. $300,000. Walter P. Moore, 4605 Montrose St., consult. engr. Harvin C. Moore, 2006 W. Alabama St., engr.

Tex., Littlefield—POWER PLANT—Southwestern Public Service Co., Mercantile Bank Bldg., Dallas, power plant units imprvs. $200,000.

Tex., Navasota—MILL—H. Schumacher Oil Works, Navasota, expanding cotton seed oil mill, incl. Anderson Expeller unit addn. $100,000.

Wis., Milwaukee—PLANT—Butter Co., 221 W. Monroe St., Chicago, Ill., 1 story 50,000 sq. ft. paper plant $300,000.

Wis., Sheboygan—PLANT—Plastics Eng. Co., 1607 Gelle Ave., plans by W. C. Weeks Inc., 718 Ontario Ave., 2 story, 80x170 ft., concrete, steel concrete blocks plant addn.

UNCLASSIFIED

Ala., Athens—ELECTRIC SYSTEM—City, electric sys. imprvs., $150,000, McWhorter & Franklin, W. Melrose Bldg., Nashville, Tenn., consult. engrs.

Calif., Lompoc—SWIMMING POOL—City, 42x75 ft. municipal swimming pool. Brooks & Miller, 2138 E. Huntington Dr., Duarte, consult. engrs. CD 11/19.

Ind., Columbia City—SWIMMING POOL—City, City Hall, 50x100 ft. swimming pool, $100,000.

Iowa—RURAL DISTRIBUTION LINES—Linn County Rural Electric Co-operative, Marion, 33 mi. tie lines, communication equip., headquarters facilities, Linn Co. $285,000. A. W. Grubb, Vinton, consult. engr.

Mich., Lansing—SWIMMING POOL—City, Cemetery & Parks Comn., 202 City Hall, 80x120 ft., swimming pool, filtration sys., dressing rooms, lockers. $170,000. Wesley Bintz, 301½ S. Washington St., consult. engr.

▲ **Mich., Ludington**—CARFERRY SLIP—Chesapeake & Ohio Ry. Co., L. T. Nuckols, ch. engr., 823 E. Main St., Richmond 10, Va., raze No. 1 carferry slip and relocate north of present No. 2 slip, constr. new tracks in east and west railroad yards, install new track scales. $1,000,000.

Nebraska—PIPE LINE—Ohio Oil Co., 539 S. Main St., Findlay, O., 4 mi. pipe line vicinity of Sidney, $125,000. George Sowards, c/o owner, ch. oil engr. CD 8/8/49.

O., Cleveland—SUB-STATIONS, LOBBY—Cleveland Transit System, 1404 E. 9th St., Zone 14, four substations to house power rectifiers. $250,000; ramp and passenger lobby in Cleveland Union Terminal. $150,000 both for Cleveland Rapid Transit System now under const. Morse W. Rew, c/o owner, engr. CD 2/9/50.

O., Toledo—SWIMMING POOL—Bd. Educ., Linwood and Southard Ave., indoor-outdoor swimming pool at DeVilbiss High School. $300,000. To be financed by 2-mill levy to be submitted to voters 11/3.

▲† **R. I., Newport**—BERTHING PIER—First Naval District, 495 Summer St., Boston, Mass., berthing pier, Naval Base, Coddington Cove. $4,000,000.

Texas—RURAL DISTRIBUTION LINES—Southwestern Public Service Co., Mercantile Bank Bldg., Dallas, rural distr. electric lines extens., Lamb Co. $335,000.

Tex., Big Lake—UNDERGROUND CAVITY—Continental Oil Co., Sterling Bldg., Houston, 2 m.g. underground cavity for storage of propane or butane, near here. $150,000.

Tex., Brenham—TELEPHONE LINES—Southwestern Bell Telephone Co., Brenham, exten. pole telephone lines, $121,300.

Tex., Brownsville—STADIUM—Brownsville Independent School Dist., $100,000 bond election Aug. 21, stadium, $516,000.

▲ **Tex., Houston**—DOCK IMPRVS.—Port Comn., Wharf 13, bond election Sept. 5, Long Beach Dock imprvs., $500,000; Warehouse No. 1, $1,500,000; Warehouse No. 2, $1,250,000; Wharf No. 1, $2,275,000; Wharf No. 2, $1,975,000; Grain Wharf, $950,000; constr. grain unloading proj., $450,000. CD 6/5.

Tex., Lubbock—RADIO STATION—The Plains Radio Broadcasting Co., Lubbock, plans by Atcheson & Atkinson, Sanford Bldg., Lubbock, radio station, studios, station facilities. $125,000. CD 10/29.

Tex., Odessa—COLISEUM—Ector Co., Paul McCollum, judge, Odessa, plans by Delmar Groos & Assoc., 1900 Kermit Hy., 120x244 ft. steel, corrugated metal Fair Park Coliseum. $433,800.

Tex., Schulenburg—TELEPHONE SYSTEM—Colorado Valley Co-operative, Schulenburg, rural telephone sys. $300,000.

Wash., Olympia—SWIMMING POOL—Disabled American Veterans, Chapter 24, Olympia, swimming pool. $200,000.

▲ **Alaska, Whittier**—PIERS, etc.—U. S. Eng., Anchorage, reconstr. piers and bldgs. $6,000,000.

▲ **Ont., Toronto** — GRANDSTAND — Canadian National Exhibition Assn., Exhibition Park, Toronto, exten. grandstand, rein.-con. open stadium. $2,000,000. Oscar Pearson, Toronto City Parks Comr.

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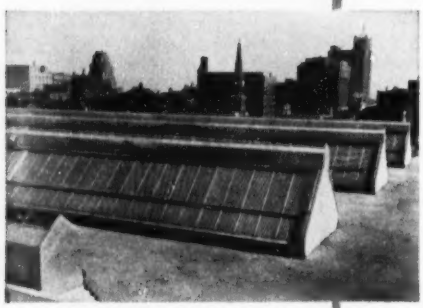

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- You build in Efficient Lighting . . softly diffused daylight in either white or heat absorbing actinic glass, eliminating harsh shadows, glare
- You build in Low Maintenance . . . a skylight with nothing to corrode, nothing to replace, nothing to re-paint
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Original Pennsylvania Corrugated Wire Glass Construction is a complete unit of glass and sheet metal parts. Standard width sheets measure 27¾". Installation is made without supplementary frames—Corrugated Wire Glass is applied directly on wood, steel or concrete.

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The difference between Life... and Death...

"Why should you give blood? Ask me—I ought to know. I fought in Korea. But since then I've been through the biggest battle of all—the battle for life itself. And it was blood—and blood alone—that saved me. Don't know when I'll be in a position to start repaying my debt by giving some blood of my own. But I will—some day. You can count on it!"

All kinds of people give blood—for all kinds of reasons. But every reason for giving blood is a *special* reason . . . just as every American life that can be saved at any time and at any place . . . is special. So whatever *your* reason for giving blood, this you can be sure of: Whether it goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

HOW TO HANDLE WET JOBS

#20 of a Series

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East Chicago, Ill.

Contractor: O. R. Burden Const. Co.

WELLPOINT PUMPS HANDLE 22 FT SUCTION LIFT

LOWERING 16 ft of water at this lift would ordinarily mean placing wellpoint system on a berm below ground. Actually, as photo shows, results were achieved in the simplest way, without additional excavation, the wellpoint line and pumps working from street level. Other noteworthy items revealed by the photo include: (a) pre-drainage with wellpoints on only one side of wide trench; (b) the open-cut method, eliminating costly sheeting.

• The foregoing are typical of the efficiencies of the Griffin Wellpoint systems (several used continuously) on this vast project which involved mile on mile of digging, with the majority of the pipelines laid far below ground water table in deep trenches containing water-bearing sands. Progress rate? Even in many of the swampland sections, it topped 500 ft per day. For "quick-dry" . . . specify . . . Griffin.

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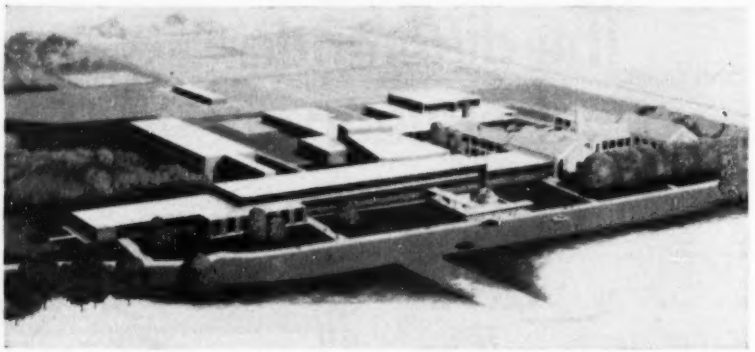
UNIT PRICES



SPRINGFIELD HIGH SCHOOL—Model for $2,900,000, twelve-hundred pupil school, Springfield, Pennsylvania.

High school, Pennsylvania

A $2,900,000 high school is now being erected at Springfield, Delaware County, Pa. Turner Construction Co. is the general contractor for the school and Harry G. Stewart, Philadelphia, is the architect.

The building will accommodate a maximum of 1,200 pupils. There will be 16 regular classrooms and a full complement of offices and rooms for all special departments including shops. A stage and property room, an auditorium, and a large gymnasium, convertible into two smaller gyms by a movable center wall, are included.

The interior finish of cinder block will be either painted or veneered with glazed tile. Riveting costs are being eliminated by the use of high-tensile strength bolts.

The following are comparative estimates for two-story sections of the school.

Two story sections

Pipe columns
Concrete girders
L.W. concrete joists pre cast
2" top slab on steel tex
Roof insulation
Slag roof
Hung acoustic ceiling ..... $3.80 per square foot

Pipe columns
Concrete beams & 2-way slab
Roof insulation and slag roof
Acoustic material on slab soffit in rooms
Acoustic ceiling hung in corridors ..... $4.04 per square foot

Pipe columns
Concrete girders
L.W. concrete joists @ 48" clear spacing
2½" concrete slab on smooth forms
Acoustic material on slab soffit in rooms
Acoustic ceiling hung in corridors
Roof insulation & slag roof ..... $4.30 per square foot

Pipe columns
Steel girders
Steel bar joists @ 24"
2" top slab on steeltex
Roof insulation & slag roof
Hung acoustic ceiling ..... $3.25 per square foot

Pipe columns
Laminated wood girders
Timber beams
2" wood plank
Roof insulation & slag roof
Acoustic ceiling on wood furring ..... $2.66 per square foot

Structural steel columns
Steel beams
Bar joists
Kaylo roof slabs (which insulate)
Slag roof
Hung acoustic ceiling ..... $3.72 per square foot

Trunk sewer, Connecticut

Eight bidders competed for the $41,176 Avon Park storm water trunk sewer contract awarded by the town of Stratford, Connecticut. S. D. & W. Construction Co. was the low bidder and received the contract. Bowe, Albertson & Associates, New York City, are the engineers.

The contract provides for 110 lin ft of 48-in. and 54-in. reinforced concrete culvert pipe along streets and 2,200 lin ft of ditch improvement through meadows to complete the drainage system of a low, flat section of town. The water table is about one foot below the ground surface.

In this area plasterers are receiving $3.95 per hr; structural iron workers, $3.50 per hr; carpenters, $3.24 per hr; and common laborers, $2.05 per hr.

Bidders include:

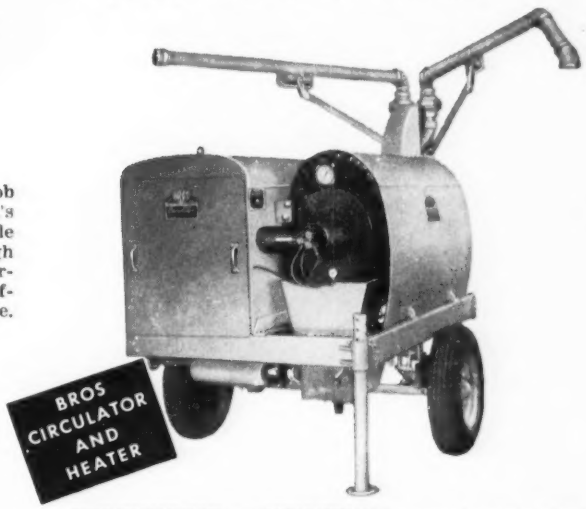
1C S. D. & W. Const. Co., Inc., Hartford Conn $41,176
2 Consolidated Const. Co., Hartford, Conn 44,240
8 J. F. Barrett & Sons, Stratford, Conn 58,946

Bids: 6-22-53 Item	Unit	Quantity	Unit Prices 1 C	2
15" RC pipe sewer, 0'-4'	lf	100	$12.00	$6.50
4'-6'	lf	80	14.00	8.00
48" RC culv pipe sewer				
4'-6'	lf	590	25.00	22.00
6'-8'	lf	100	25.00	24.00
54" RC culv pipe sewer				
4'-6'	lf	317	28.00	25.00
6'-8'	lf	100	28.00	28.00
Shallow MH 6'x6'	ea	4	400.00	400.00
Type C catch basin	ea	6	300.00	250.00
Conc sidewalk	sf	200	1.00	0.75
Conc driveway	sf	50	2.00	1.00
Conc curb	lf	20	5.00	2.00
Class A concrete	cy	5	30.00	30.00
Class B concrete	cy	10	25.00	20.00
Reinforcing steel	lb	100	0.20	0.15
Timber, sheet & bracing, mfbm		5	125.00	120.00
Exc, special struct	cy	10	5.00	5.00
Exc, backfill, utility	cy	10	10.00	5.00
Gravel, cr stone fndn	cy	100	3.00	6.00
Rock excavation	cy	10	15.00	10.00
Conc mary, exc	cy	5	15.00	20.00
Test pits	cy	10	5.00	5.00
Rip rap	cy	5	20.00	20.00
Calcium chloride	lb	1,500	0.10	0.06
Stream improvement	cy	5,600	0.60	2.00
Sanitary house connec	ea	5	50.00	20.00
Water, gas house services	ea	10	80.00	10.00

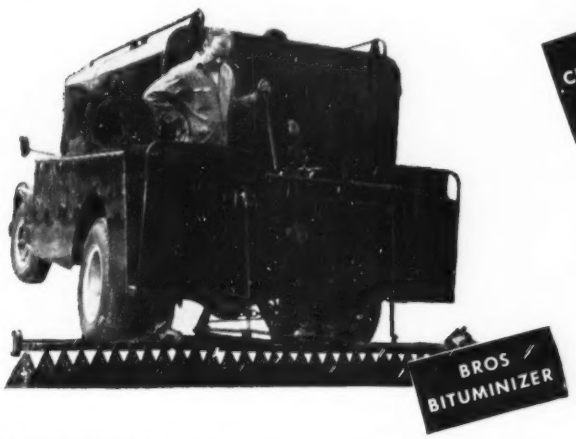
Handling Bitumens? Want to Cut Costs?

One of the best answers to high operating costs these days is *better equipment* . . . equipment that works fast . . . with highest possible efficiency . . . and that stands up day after day under all kinds of operating conditions. For the handling of bitumens, these *Bros* units are terrific. They've got new, exclusive design features . . . they're simple . . . and they're built with extra muscle and strength for long life. They'll pay their way on your next job!

FOR HEATING asphaltic materials faster, and for any job where steam is needed, you can't beat this *Bros* steamer. It's portable, compact, weatherproof. It has the best possible boiler design for an uninterrupted supply of steam at high ratings. Its working controls are so simple anyone can operate it. Requires only routine blow-downs because it is self-cleaning. No water treatment necessary. Three sizes available. Make steam the best way—the *Bros* way!



FOR PUMPING and HEATING bitumens in spots where steam is not needed, this *Bros* unit will earn your praise in short order. It has an exclusive 2-way heating feature for faster and more even heating. A low center of gravity makes roadability a big feature—take it anywhere! Has 4 distinct pumping speeds with widest heat transfer range. Material can be left in unit and re-heated to help start cold tank cars. It's the champ of its class!



FOR SPREADING with greatest control at lowest cost, here's your answer! Take a look—the gingerbread is gone. No complicated gadgets or congested piping—this new streamlined *Bros* unit sets a new standard of distributor design. Its amazing heating action comes from a tremendous heating surface area. Operators say the working end is so easy to operate that they can spread better and faster than ever before!

THE BROS SPRAYMATIC BAR can show you something new in bar action. It has a new type of positive action nozzle which *cannot* clog. No more streaking or costly second passes. 100% distribution and sharp cut-off at nozzle eliminate suck-back operation.

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3. NO LAG, NO FALSE ALARMS. The instant the surrounding air temperature hits the danger point, DETECT-A-FIRE thermostats go into action immediately. And the protection is long-lived, trouble-free and by all means the most economical. These hermetically sealed, stainless steel detectors are resistant to corrosion. Listed by (UL) . . . approved by (FM).

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
August 24 Connecticut

BIDS ASKED—BUILDINGS

Mass., Newburyport—HOSPITAL—B.A. 9/3—Anna Jacques Hospital, Office Admin., Highland Ave., hospital addn., alterations, boiler room, Highland and Rawson Aves. $700,000. Plans deposit $50. James H. Ritchie & Assoc., 135 Clarendon St., Boston, archts-engrs., Charles L. Thompson, 135 Clarendon St., Boston, sanitary engr. CD 7/30/52, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
September 3 New York
STREETS AND ROADS
September 1 New Jersey September 3 New York

BIDS ASKED—BUILDINGS

▲ **Pa., Lansdale**—SCHOOL—B.A. 8/26—North Penn Joint School Bd., Lansdale, new Junior High School and Senior High School addn., $2,880,000. Extended date. Howell, Lewis, Shay, Packard Bldg., Phila., archts. William H. Gravell & Assocs., 2031 Chestnut St. Bldg., Phila., engrs. CD 8/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Merritt-Chapman & Scott Corp.**, 260 Madison Ave., New York 16, N. Y., CA $4,726,052, Henry C. Schlaich Memorial Bridge, between Long Beach and Island Park, MINEOLA, N. Y. Bd. Supervs. Nassau Co., Old Court House, Mineola, N. Y. Bids July 21. J. E. Greiner Co., 1201 St. Paul St., Baltimore, Md., consult. engr. CD 7/22, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,

Francis A. Canuso & Sons, 173 W. Roosevelt Blvd., Phila., Pa., LB, $1,674,403, paving 3.895 mi. Route 44, U.S. 130, Sections 9C, 11B, 14B and 15C Woodbury Creek to Berkley Road, East Greenwich, West Deptford and Greenwich Twps., and Paulsboro Boro, U-122 (12), Gloucester Co. Bids Aug. 11. CD 7/23.

NEW JERSEY—New Jersey Hy. Auth., State Hy. Dpt. Office Bldg., 1035 Parkway Ave., Trenton

S. J. Groves & Sons Co., State Hy. No. 35, Woodbridge, N. J. LB, $946,979, Contr. 134, Sect. 8, paving, grading, drainage, structures, Route 4 Parkway to Route 9 in Dover Twp., Garden State Parkway, Ocean Co. Bids Aug. 10. CD 7/22.

▲ **Arundel Corp.**, Pier 2, Baltimore, Md., LB $11,590,000, est. $12,500,000. Phase 1 and 2 Ashburton Filtration Plant, BALTIMORE, MD. Bureau Water Supply, 503 Municipal Bldg., Baltimore 2, Md. Bids 8/12. CD 8/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Castagna & Sons, Inc.**, 1711 Sheepshead Bay Rd., Brooklyn 29, N. Y., LB, $1,049,497, Contr. 1A, foundations and structural steel work, for constr. of City PRISON and REMAND SHELTER, Atlantic Ave., Boerum Pl., Smith and State Sts., BROOKLYN, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Aug. 12. CD 7/23.

▲ **Walter Kidde Constructors, Inc.**, 140 Cedar St., New York, N. Y., CA, $2,000,000. HOSPITAL addn., and MATERNITY BLDG., new SWITCH HOUSE, ENGLEWOOD, N. J. Englewood Hospital, Englewood, N. J. Bids July 15. CD 7/1.

▲ **Louis H. Cahan & Co.**, W. State St., Trenton, N. J., CA, $1,000,000, GARDEN APARTMENT DEVELOPMENT, TRENTON, N. J. Bruce Park Apartments, c/o contractor. Harry Sternfeld, 1411 Walnut St., Phila., Pa., archt.

▲ † **Lukens Steel Co.**, 1949 Gillen St., Coatesville, Pa., Own Forces, $10,500,000 design and construct armor-plate producing plant with continuous heat treating furnaces for Navy Dpt., COATESVILLE, PA.

▲ **United Engineers & Contractors, Inc.**, 1404 Arch St., Phila., Pa. CA, $6,000,000. Design and construct STRIP MILL, CONSHOHOCKEN, PA. Alan Wood Steel Co., Conshohocken, Pa. CD 7/31.

▲ **Oakdale Development Co., Inc.**, 163-18 Jamaica Ave., Jamaica, N. Y., Separate Contracts, $1,700,000 RESIDENTIAL DEVELOPMENT, MORRISVILLE, PA. Charles A. Wood, Amityville, N. Y., archt.

▲ **Alexander Alessi**, 103 Lancaster Ave., Wayne, Pa., Separate Contracts, $1,200,000, RESIDENTIAL DEVELOPMENT, Conshohocken Rd., NARBERTH, PA.

▲ **Michael R. Cozza**, 315 Hays Ave., Pittsburgh, Pa., CA, $1,500,000, 1 story, L-shaped 150x700 ft. and 100x215 ft. brick, block SHOPPING CENTER, incl. 27 stores, NATRONA HEIGHTS, PA. John P. and Alex Marino, 715 Western St., Tarentum, Pa. CD 7/14.

▲ **Sam Verman**, 2211 Beechwood Blvd., Pittsburgh, Pa., CA, $1,250,000, 2 story, steel brick block SHOPPING CENTER NEW KENSINGTON, PA. A. J. Aberman, Inc., Standard Life Bldg., Pittsburgh, Pa. Hyman Rosenberg, 813 Berger Bldg., Pittsburgh, Pa., archt.

▲ **Hughes-Foulkrod Co.**, 1505 Race St., Phila., Pa., CA, $9,000,000, Manufacturing PLANT EXPANSION, OAKS, PA. B. F. Goodrich Co., 448 Main St., Akron, O. CD 7/29.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 25 North Carolina September 11 Alabama
STREETS AND ROADS
August 25 North Carolina September 11 Alabama

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Hudson Engineering Corp.**, 2711 Danville St., Houston, Tex. CA $1,500,000. expanding Gillis Natural Gasoline PLANT, LAKE CHARLES, LA. Continental Oil Co., Sterling Bldg., Houston, Tex. CD 3/28/51.

▲† **Tennessee**—Tennessee Valley Auth., New Sprankle Bldg., Knoxville, Tenn. awarded contracts for Widows Creek Steam Plant, Ala., John Sevier Steam Plant, Tenn., Gallatin Steam Plant, Tenn., Kingston Steam Plant, Tenn., Shawnee Steam Plant, Tenn., Colbert Steam Plant, Ala. and Miscellaneous. Grand total $3,053,702.

WIDOWS CREEK STEAM PLANT, ALA.

Brooks-Fisher Insulating Co., 686 Greenwood Ave. N.E., Atlanta, Ga. CA $106,397. installing boiler insulation;

Babcock & Wilcox Co., Sterling Ave., Barberton, O. CA $55,707. soot blower equipment;

JOHN SEVIER STEAM PLANT, TENN.

Lambert Brothers, Inc., Alcoa Hy. S.W., Knoxville, Tenn. CA $97,750. rip rap stone, supplement to original order;

Volunteer Portland Cement Co., 502 Gay St. S.W., Knoxville, Tenn. CA $378,465, cement;

Noland Co., Inc., 115 Market St., Chattanooga, Tenn. CA $67,937, vertical boring mill;

Crane Lumber & Tie Co., 909 W. Cermak Rd., Chicago, Ill. CA $75,810, creosoted cross ties;

GALLATIN STEAM PLANT, TENN.

Ralph Rogers & Co., Inc., 720 Argyle Ave., Nashville, Tenn. CA $509,654, concrete aggregates and crushed stone;

Buell Engineering Co., Inc., Nazareth, Pa. CA $139,860, fly ash collectors;

KINGSTON STEAM PLANT, TENN.

Alabama Cement Tile Co., 615 N. 33 St., Birmingham, Ala. CA $73,248, precast concrete roof and floor slabs;

SHAWNEE STEAM PLANT, TENN.

Babcock & Wilcox Co., Sterling Ave., Barberton, O. CA $87,944, steam generating units, supplement to original contracts to cover addnl. wall soot blowers, piping and accessories;

Allis Chalmers Mfg. Co., 1126 S. 70 St., Milwaukee, Wis. CA $22,483, main control switchboards, supplement to original contract;

COLBERT STEAM PLANT, ALA.

H. H. Robertson Co., 14 St. Ambridge, Pa. CA $267,550, metal siding panels and misc. appurtenant items;

MISCELLANEOUS

Moloney Electric Co., 5390 Bircher St., St. Louis, Mo. CA $350,655, transformer;

Wagner Electric Corp., 6400 Plymouth St., St. Louis, Mo. CA $358,536, transformers;

South East-Joslyn Co., 2036 Dana St., Cincinnati, O. CA $77,000, disconnecting switches;

Connors Steel Co., Div. H. K. Porter Co., Inc., 5000 Powell Ave., Birmingham, Ala. and **Wilson-Weesner Wilkinson Co.**, 202 W. Morelia Ave., Knoxville, Tenn. CA $50,000, reinforcing steel;

Power Equipment Co., 1430 Island Home Ave. S.E., Knoxville, Tenn. CA $92,072, earth moving equipment;

Nashville Bridge Co., Shelby Ave., Nashville, Tenn. CA $192,634, metal work in bridge superstructure;

Tennessee Coal & Iron Division, U.S. Steel Corp. Co., 28 W. State St., Trenton, N. J. CA $50,000, wire rope.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 25 Michigan
STREETS AND ROADS
August 25, 26 Michigan

SOON LETS CONTRACT—BUILDINGS

Ill., Chicago—APARTMENT—Terrace View Apartments, Inc., c/o R. K. Kill, archt., 111 W. Monroe St., Zone 3, soon lets contract 87-unit apartment, 6127 Winthrop St., $900,000. Fred Marshall, 111 W. Monroe St., Zone 3, engr.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **R. and R. Constr. Co.**, 13 and Esther Sts., Alton, Ill., CA, $1,750,000, ¾ mi. racetrack incl. grandstand, clubhouse, stables, parking areas, fencing, lighting, drainage, etc., Cahokia Downs on U.S. 460, mile and half east of here adjacent to Grand Marais State Park, EAST ST. LOUIS, ILL. East St. Louis Jockey Club, c/o John H. Steele, vice pres. and exec. dir., Springfield, Ill. CD 7/20.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Frischkorn Constr. Co.**, 11420 Riverdale St., Redford, Mich. Owner Builds. $3,500,000. brick HOMES, Golf Heights, West McNichols Rd., adjacent to Glenhurst Golf Course. REDFORD, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 25 Iowa August 27 Missouri
August 28 Kansas
STREETS AND ROADS
August 25 Iowa August 27 Missouri
August 28 Kansas

▲† **Tex., Kelly Air Force Base**—HANGAR, SHOP, etc. —B.A. 9/10—U.S. Govt., c/o Direc. of Procurement, Bldg. No. 43, Kelly Air Force Base, San Antonio, airplane repair hangar, $6,000,000; 504,000 sq. ft. base maintenance shops, $3,500,000; 315,150 sq. ft. heavy rein.-con. paving for supporting B-36's and heavy bombers, $2,500,000; utilities, water lines, general area paving, $500,000, (J-104-34 and J-104-35). Serial No. IFB-41-608-54-5B. Extended date. CD 7/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **IOWA**—State Hy. Comn., Ames,

Booth & Olson, Inc., 529 Insurance Exchange Bldg., Sioux City, Ia., LB, $157,602, paving 3.262 mi. Special F-291 (2), Monona Co.; LB, $307,932, paving 6.514 mi. Special F-245 (2), Woodbury Co.;

Central Constr. Co., Indianapolis, Ia., LB, $261,061 paving 3.859 mi. FI-8 (4), Decatur Co.;

Quad City Constr. Co., 644 25 Ave., Rock Island, Ill., LB $619,315, paving 11.622 mi. Special FN-352, Henry and Louisia Counties;

Fred Carlson Co., Decorah, Ia., LB, $1,009,809, paving 15.439 mi. F-887 (2), Linn Co.

Concrete Materials & Constr. Co., 405 Granby Bldg., Cedar Rapids, Ia., LB, $64,955, pavement wid'n. 14.096 mi. P-1045, Mills and Pottawattamie Counties;

Jackson Constr. Co., Emmetsburg, Ia., LB, $102,355 pavement wid'n. 5.268 mi. FN-917, Story Co.;

Land Constr. Co., 502 Seneca St., St. Joseph, Mo., LB, $229,204, b. conc. resurf. 17.881 mi. Iowa and Keokuk Counties. Bids Aug. 11. CD 8/4.

† **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. LB $269,709. constr., repair dikes, revetment adjacent to Missouri River at Upper Barney-Lower Sonora Bends in Atchison Co., Mo. and Otoe and Nemaha Counties, Neb., MISSOURI and NEBRASKA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Aug. 4. CD 7/20.

▲ **Oklahoma Pipe Line Constructors**, 6612 Hines Blvd., Dallas, Tex. CA $9,975,000. 150 mi. 30 in. natural gas line;

Western Pipe Line Constructors, Inc., 311 E. 11 St., Austin Tex. CA $8,550,000. 165 mi. 30 in. gas pipe line between Kingman and Flagstaff;

R. H. Fulton & Co., Box 1526, Lubbock, Tex. CA $13,080,000. 252 mi. 30 in. gas pipe line from Corona to Gallup, N. M.

Own Forces. $9,985,000. 204 mi. 30 in. gas line from Gallup to Flagstaff, N. M., TEXAS, NEW MEXICO, ARIZONA. El Paso Natural Gas Co., Bassett Tower, El Paso, Tex. Grand total $41,590,000. CD 2/5/53.

BUILDINGS

LOW BIDS AND CONTRACTS

Steenberg Constr. Co., 1371 Marshall Ave., St. Paul, Minn. LB $859,600. 4 story St. Joseph's HALL to house college library, ST. PAUL, MINN. St. Catherine's College, 2004 Randolph Ave., St. Paul, Minn. Bids Aug. 5. CD 7/10.

▲ **J. E. Dunn Constr. Co.**, 929 Holmes St., Kansas City, Mo. LB $1,829,785. general contract;

U. S. Engineering Co., 914 Campbell St., Kansas City, Mo. LB $508,780. plumbing and heating for Intercity High SCHOOL, Truman and Winner Rds., KANSAS CITY, MO. Bd. Educ., Dr. G. Dewey Smith, asst. supt., Library Bldg., Kansas City, Mo. Bids Aug. 6. CD 7/23.

▲ **Carmichael & James Constr. Co.**, Hastings, Neb., and **Geer-Mauer Constr. Co.**, Grand Island, Neb., LB, $1,545,000 general contract, Senior High SCHOOL, HASTINGS, NEB. Bd. Educ., Hastings, Neb. Bids July 24.

Wichita Federal Savings & Loan Assn., Broadway and Waterman Sts., Wichita, Kan., rejected bids July 7, 10 story office with penthouse, WICHITA, KAN. LB $811,949. CD 7/22, under LB.

▲ **Wells Constr. Co.**, 2504 E. 14 Pl., Tulsa, Okla., CA $1,500,000, 4 story, 50x200 ft. MEDICAL CENTER, 1700 S. Utica St., TULSA, OKLA. Utica Square Medical Center, Inc., 1754 Utica St., Tulsa, Okla. CD 5/1.

▲ **Otis E. Nidiffer**, 4720 E. 21 St., Tulsa, Okla., Owner Builds, $1,500,000, 102 brick HOUSES, TULSA, OKLA.

▲ **Robert E. McKee**, 2708 Inwood Rd., Dallas, Tex. CA Est. $15,000,000. 8 story HOTEL, incl. swimming pool, Commerce St., DALLAS, TEX. Hotel Statler,

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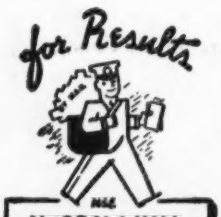

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GUNITE ENGINEERS & CONTRACTORS
285 MADISON AVE. NEW YORK CITY

Seventh Ave. and W. 33 St., New York, N. Y. Bids June 30. CD 5/12.

▲ **Cowdin Brothers,** 411 S. Haskell St., Dallas, Tex. CA $3,000,000. OIL CENTER, DALLAS, TEX. General American Oil Co. of Texas, Republic Bank Bldg., Dallas, Tex. J. M. McCammon, Southland Life Annex Bldg., Dallas, Tex., archt.

▲ **Quaker Valley Constructors, Inc.,** Orange, Tex. CA $22,000,000. chemical PLANT on 310 acre site, ORANGE, TEX. Spencer Chemical Co. of Texas, c/o Kenneth Spencer, Orange, Tex. Wyatt C. Hedrick Eng. Corp., 5201 Fannin St., Houston, Tex., engrs. CD 7/23, under CA.

Pan-American Refining Corp., Texas City, Tex. Purchase,

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
September 3 California
STREETS AND ROADS
September 2, 3 California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **R. V. Lloyd,** Coachella, Calif., CA, $2,622,499, est. $2,606,538, earthwork, pipe lines, structures, Unit 1, Delano-Earlimart Irrigation Dist., Central Valley Proj., Spec. DC 3980, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Lindsay, Calif. Bids July 16. CD 7/21, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Commercial Builders, Inc., Moscow, Idaho, CA, $908,530 general contract rein.-con. DORMITORY, MOSCOW, IDAHO. University of Idaho, Moscow, Idaho. Bids July 9. CD 7/15.

▲ **Del E. Webb Constr. Co.,** 5101 San Fernando Rd., Los Angeles, Calif., CA, $14,000,000, 8 story, 93,284 sq. ft., rein.-con. HOTEL, BEVERLY HILLS, CALIF. Beverly Hills Development Co., 523 W. 6 St., Los Angeles, Calif. Welton Becket & Assoc., 5657 Wilshire Blvd., Los Angeles, Calif., archts. CD 9/6/50, under CA.

† **F. E. Young Constr. Co.,** 2141 Main St., San Diego, Calif., LB, $807,000, 1 story, 75x316 ft., concrete SUBSISTENCE bldg. with 72x100 ft. wing and 64x60 ft. storage, Naval Amphibious Base, NOY 74060, Spec. 35095, CORONADO, CALIF. P. Wks. Office, Dpt. Navy, San Diego, Calif. Bids Aug. 6. CD 7/9.

▲ **C. F. Braun & Co.,** 100 S. Fremont Ave., Alhambra, Calif., CA, $1,700,000, platforming unit at Shell Oil Co. REFINERY, MARTINEZ, CALIF. Shell Oil Co., Shell Bldg., San Francisco, Calif. Awarded Aug. 7. CD 1/8.

▲ **John E. Branagh & Son,** 42 LaSalle Ave., Piedmont, Calif., LB, $1,345,000, Herbert Slater Junior High SCHOOL, SANTA ROSA, CALIF. Santa Rosa High School Dist., 211 Ridgeway Ave., Santa Rosa, Calif. Bids Aug. 6. CD 7/29.

CANADA

BIDS ASKED—BUILDINGS

▲ **Ont., Toronto**—MEN'S RESIDENCE—B.A. 9/9—University of Toronto, Simcoe Hall, 3 story, two wings men's residence, St. George St., $1,500,000. Plans deposit $50. Mathers & Haldenby, 15 St. Mary St., archts. CD 5/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Smith Bros. & Wilson Ltd.,** 1267 Richards St., Vancouver, B. C., CA, $1,686,494, SCHOOL addn., Broadway and Penticton Sts., VANCOUVER, B. C. Vancouver School Bd., 1595 W. 10 Ave., Vancouver, B. C. Bids July 9. CD 7/28, under LB.

▲ **Principal Investments Ltd.,** 67 Richmond St. W., Toronto, Ont. Owner Builds. $5,500,000, 7 story, 300-room HOTEL, on site of Yonge St. Arcade with stores on ground floor, first floor offices, off street parking for 100-cars, TORONTO, ONT. CD 5/27.

▲ **Foundation Co. of Canada Ltd.,** 1220 Bay St., Toronto, Ont., CA, $2,000,000, superstructure for 1 story, 400x900 ft. WAREHOUSE, west of Old Malton Rd. at Islington, TORONTO, ONT. Simpson-Sears Ltd., 170 Yonge St., Toronto, Ont. Bids July 15. CD 6/18.

▲ **Bergerville Estates Ltd.,** 4115 St. Hubert St., Montreal, Que., CA, $1,000,000, BUILDING addn., QUEBEC CITY, QUE. Quebec Workman's Compensation Comn., 223 Grande Allee, Quebec City, Que. L. Mainguay, 1045 Chaumont St., Sillery, Que., archt.

U. S. POSSESSIONS

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Campbell Constr. & Equip. Co.,** 1050 Folsom St., San Francisco, Calif., CA $527,000, repairing, rehabilitation of gasoline fuel lines, Hickam Field, Inv. H-9D, HONOLULU, HAWAII. U. S. Eng. Honolulu, Hawaii. Awarded Aug. 7. CD 6/8, under LB.

▲ **Hawaiian Dredging Co.,** Honolulu, T. H. CA $1,924,929. overseas terminal at Pier 2, HONOLULU, T. H. Bd. Harbor Comrs., Territorial Government, Honolulu, T. H.

(Proposal Advertisements see pp. 156 to 159)

July drop in house starts worries home builders

But some government experts think shortage of mortgage money is only temporary

J. P. Chamberlain
Associate Editor

The government's estimate last week that housing starts dropped to 96,000 in July has provided more ammunition for home builders who believe that the tightness of mortgage money is going to lead to a sharp decline in building starts, and want the government to rescue them.

The July estimate of 96,000 nonfarm house starts compares with 103,000 starts in June and about 103,000 for July 1952. It marks the third straight month that starts have declined. The high point this year was April, when the Bureau of Labor Statistics estimated 111,000 starts.

Of course, it's normal for starts to reach their peak some time in the second quarter of the year and then decline gradually. But this time the decline has the builders worried.

• **Pessimists**—Some government economists who keep close tabs on the building industry agree that housing starts are due for a sharp drop in coming months. They point to the recent decline in appraisal applications for VA mortgages, as a major clue to this trend. They think the heavy volume of housing starts this year is not such an optimistic sign.

Says one economist: "When a development builder gets to the point of starting his houses, he's already halfway through the process of putting up a development. He already has his capital tied up in the raw land, possibly for quite a long time. That's why, when mortgage money started getting so tight this spring, it didn't stop builders from going ahead and starting houses. They want to get their capital out, even though it may be hard for them to arrange mortgage financing on their houses. But once they have wound up their current developments, they are likely to be pretty slow about starting over again."

• **Optimists**—But other government people are optimistic. They are of the opinion that the present shortage of mortgage money is temporary. Eisenhower's top adviser, Arthur F. Burns (ENR July 23, p. 60), said last month that he expects starts to go well over a million this year.

Economists who take an optimistic view of housing starts believe there will be a heavy volume of funds available for investment in mortgages. Even though mortgages are not as popular with banks and life insurance companies as they used to be, these institutions are starting to get a heavy volume of amortization payments from existing mortgages which they must invest somewhere. A good part of these funds, it's expected, will go into new mortgages.

• **Insurance companies**—First-half reports published last week give the optimists considerable support. The Institute of Life Insurance said that U. S. life insurance companies took on more than $2.1 billion of new mortgages of all kinds during the first six months of 1953, amounting to 30% of their investments during that period. During the similar period last year, they invested almost $2 billion in mortgages, which was 27% of new investments. They bought more FHA mortgages than last year—$443 million as compared with $420 million. But they bought only $170 million of VA mortgages, compared with $271 million in the first half of 1952.

As of last June 30, the life insurance companies had about 30% of their assets invested in mortgages. A year before they had 29%. This increase in the ratio of mortgages to total assets is important, because it indicates that these investors have not yet reached the point where they consider that their investment portfolios are too heavy with mortgages.

• **Savings banks**—Another large group of investors, the mutual savings banks, reported that they had increased their holdings of mortgages during the first half of this year. The National Association of Mutual Savings Banks said that on June 30, savings banks held nearly $12 billion worth of mortgages, or 45% of their total assets. That's up from 44% a year ago.

Another factor which the optimists rely on is the rapid growth of savings and loan associations, which put nearly all their assets in residential mortgages. These associations now hold about $19 billion of mortgages, and are now the largest class of investors. That's about 31% of all outstanding home mortgages.

• **Other factors**—However, your estimate of whether housing starts will drop this year, or will continue at somewhere close to the one-million-plus rate of recent years, depends on factors outside the mortgage market.

For the federal government, state and local governments, and corporations, are all competing with prospective home owners as borrowers of long-term funds. If they are going to provide strong competition in coming months, then mortgage money will continue to be fairly expensive to borrow.

If the Treasury is willing to increase the rate it will pay for long-term money, as it did this spring when it paid 3¼% on an issue of long-term bonds, the other borrowers will have to compete.

However, chances are that the Treasury won't be a strong competitor. Its long-term bond issue last spring put the bond market into a sharp decline and created the mortgage "tightness" about which construction men have been complaining ever since. In order to steady the bond market and allow the Treasury to do more borrowing, the Federal Reserve System had to step in and ease the situation (ENR July 2, p. 74). That has done a lot to bring about a recovery in the bond market (ENR July 23, p. 78). Eventually, it should help make things easier for mortgage borrowers.

State and municipal borrowers will continue to be strong competitors for long-term funds, however, as ENGINEERING NEWS-RECORD's backlog of proposed projects shows. But corporations, which have been tremendous borrowers of long-term funds ever since the war, are expected to ease up in their demands as their plans for capital expenditures level off.

This decline should leave enough funds available to finance a million housing starts in 1954, assuming that there is no sizable recession. If a recession comes along, of course, banks and other mortgage lenders would tighten up their terms much more than they have already. And volume of lendable savings, presumably, would fall off as the incomes of wage earners declined.

CITY MANAGER CARL FRAERER, who runs neighboring city of Alameda, makes a point about public housing at Albert Cole's "shirtsleeve conference" in San Francisco early this month. Plenty of people had things to tell Cole.

Photos by Cal Pictures

COLE listened; says he is "roughing out areas of agreement and disagreement."

Albert Cole listens at the grass roots

Albert Cole, Federal House and Home Finance Administrator, wanted to get grass-roots opinions on housing problems. So he took a tour this month around the U. S., to talk with people who own and rent houses, to landlords, builders, mortgage bankers, real estate men, labor leaders, and public officials.

In San Francisco on Aug. 8, Cole spent three hours listening to people (pictures). Nobody took his coat off, but everybody had plenty to say about problems.

Builders complained about the shortage of mortgage money, wanted Cole to get the government to bring more of it to California. Labor leaders complained about the shortage of low-rent housing that has developed in this area since rent controls were dropped. Jefferson Beavers, executive of a local savings and loan association, pointed out that slum clearance and disposal of World War II temporary housing was creating a serious problem for non-whites.

Wilbur Warner, a mortgage banker, called FHA financing "confused, chaotic, and demoralizing." He and others suggested that the VA and FHA appraisal setups be combined and proposed that FHA recognize builders' sales costs and include them as a part of the normal costs of construction.

When the meeting was over, Cole said he thought it had been as educating for the participants as it had been for him and his staff. Then he moved on to the next city on his itinerary to ask more questions.

PROFIT MARGINS: STILL ON THE DOWNGRADE

	First-Half Sales 1953	1952	First-Half Profits 1953	1952	Profit Margin 1953	1952
	(in thousands)					
Air Conditioning and Heating						
Amer. Radiator	$140,824	$123,966	$14,844	$11,913	10.5%	9.6%
Minneapolis-H'well	102610	72,554	4,902	3,432	4.8	4.7
Trane Co.	20,502	21,418	882	1,048	4.3	4.9
York Corp.	46,401	33,279	1,904	1,384	4.1	4.2
Cement						
General Portland	15,374	14,712	2,388	2,555	15.3	17.4
Lehigh Portland	25,980	24,897	2,492	2,479	9.6	10.0
Lone Star	37,151	39,183	4,040	4,181	10.9	10.7
Contracting						
Merritt-Chapman	44,021	36,581	1,103	707	2.5	1.9
Machinery						
Allis-Chalmers	258,567	267,142	10,453	11,510	4.0	4.3
Bucyrus-Erie	46,029	42,331	2,845	2,672	6.2	6.3
Caterpillar	236,107	260,588	11,608	11,926	4.9	4.6
Plumbing						
Walworth Co.	21,372	25,737	273	780	1.3	3.0
Wallboard: Roofing						
Johns-Manville	123,448	116,340	11,357	11,917	9.2	10.2
Nat. Gypsum	57,599	46,366	3,991	3,492	6.9	7.5
U. S. Gypsum	94,702	88,122	10,195	9,600	10.8	10.9
Miscellaneous						
Pittsburgh Plate Glass	232,659	196,256	20,767	17,765	8.9	9.1

First-half reports of materials makers show competition is getting tougher

"For the foreseeable future, markets are apt to be far more competitive than they have been for years."

This sentence from the first-half report to stockholders of Bucyrus Erie Co. is a good forecast of what's ahead for building-materials manufacturers and building contractors. And it explains a good deal about what happened to their profits in the first half of this year.

The table (above) is a sampling of first-half reports on sales and earnings of companies connected with the construction business. Sales of most of these companies were up over the same period in 1952. But profits didn't keep pace with the gain in sales and in some cases, firms which improved their sales in the first half of this year, earned less money than in the 1952 period. The result is that 11 of the 16 companies in this sample reported that they earned less money per sales dollar than they did during the 1952 period.

In other words, while costs of raw materials (including steel) and of labor continued to rise during the first half of 1953, most of the companies in this group were not able to pass all of their higher costs on to their customers. This is all the more significant when you take into consideration the fact that price controls were dropped early this year.

It's worth noting that the profit margins shown for Merritt-Chapman & Scott Corp., are not on the same basis as the others. As a contractor, part of its business is under cost-plus-fixed-fee contracts. There is no risk on this type of business, and the profit margin on it cannot be calculated, since the fees are not published. However, the rough profit margins shown in the table do indicate the general trend.

Merritt-Chapman boosted its profits 57% over the 1952 period, while increasing gross revenues about 20%. The result, of course, was a sharp climb in profit margin. President Louis E. Wolfson explained this rise by saying that it was largely due to "greater operating efficiencies achieved through further coordination of construction activities."

Closer Bidding

Competition gets tougher for highway contractors

In spite of rising costs of construction materials, highway contractors are bidding harder on highway jobs. The composite mile index, kept on a quarterly basis by the Bureau of Public Roads, shows a 4.5% average drop in highway bid prices during the second quarter of this year, the first drop in two-and-a-half years. The latest index figure is 158.5, compared with the all-time high of 165.9 reached in the first quarter of 1953 (in this index, the 1925-1929 average equals 100).

All components of the composite index dropped below the levels they reached in the first quarter. The biggest decline was in the bid price index for structural steel shapes. It dropped 6.2% from the first quarter. The concrete pavement index declined 5.8%, while structural concrete was down 4.2%. The bid index for common excavation was down 2.4%, and reinforcing steel edged downward 0.8%.

The decline in the national index was preceded by a drop in the highway price index kept by the California Division of Highways (ENR May 21, p. 103). That index, which has been much more volatile than the Bureau of Public Roads index, started declining last year. Unlike the national index, it has also registered sharp declines in 1951 and 1952.

Flexible rates asked for FHA mortgages

U. S. life insurance companies, who are major mortgage lenders, want the government to make FHA interest rates and repayment terms flexible, to keep them in line with mortgage market conditions.

A joint committee on housing and mortgage lending of the Life Insurance Association of America and the American Life Convention, which represent practically all U. S. life insurance carriers, has suggested this to Albert Cole, Housing and Home Finance Administrator.

The committee points out that the present fixed rate on FHA mortgages is not in line with going market rates for conventional mortgages even allowing for the guarantee. So it has to be adjusted by means of discounting. It proposes that the Federal Housing Administration be authorized to set a maximum interest rate which lenders can charge on FHA loans, sufficiently far above present rates to provide lee-

way for changes in the mortgage market. Lenders and borrowers would then work out their own interest rates, provided that they did not go above the maximum.

The life insurance people also believe that lenders would be more willing to lend on FHA mortgages if there were more flexibility in the amount of down payment required and in the length of amortization period.

Industrial awards pick up sharply in third quarter

Industrial building awards, which had been on the decline during the second quarter of 1953, are picking up steam again. In the first seven weeks of this quarter, industrial building awards reported to ENGINEERING NEWS-RECORD and the Construction Daily have been running away ahead of contracts during the April-May-June quarter.

Awards for new plants have been averaging $53 million per week so far in this quarter, 64% higher than the weekly average in the previous three months. This boost in awards has brought total industrial contracts for the first 33 weeks of 1953 to 6% above the comparable 1952 period. During the first half, total industrial awards ran 3% behind the first half of 1952.

The backlog of proposed plants continues to build up rapidly, indicating that there will be a strong volume of industrial awards for some time to come. In July, new plants estimated to cost about $291 million were added to the backlog, bringing the total proposed during the first seven months to $2,268 million. That is 30% more than the volume of industrial work proposed in the first seven months of 1952.

Bidders go below engineers' estimates

If you need any proof of how anxious contractors are to get jobs these days, take a look at the results of the bidding recently on a large flood-control dam for Pennsylvania.

Cost of the First Fork Sinnemahoning Creek Dam, largest ever to be undertaken by the state, was estimated at $7.6 million by the consulting engineers, Gannett, Fleming, Corddry and Carpenter, Inc., of Harrisburg. The contract was awarded July 29 to Nello L. Teer Co. for $6,682,570.

Only two of the nine bidders were above the engineers' estimate—and not very much. The other seven were below. Here's how the bidding went:

Harrison Construction Co., Pittsburgh, Pa.	$6,739,670
Nello L. Teer Co., Durham, N. C.	6,682,570
Walsh Construction Co., New York, N. Y.	7,377,400
S. J. Groves & Sons Co., Woodbridge, N. J.	7,468,294
Arundel Corp., Baltimore, Md.	7,721,744
Moyer Brothers, Altoona, Pa.	7,527,150
Dravo Corp., Pittsburgh, Pa.	7,636,010
Morrison-Knudsen Co., New York, N. Y.	7,466,016
Central Pennsylvania Quarry Stripping & Construction Co., Hazelton, Pa.	6,787,085

Business briefs . . .

• **More aluminum**—Aluminum producers turned out 1.2 billion lb. of primary aluminum during the first half of this year, according to the Aluminum Assn. That's more than was turned out during the entire years of 1945, 1946, and 1947. Production for the first six months was 30% over the same period last year.

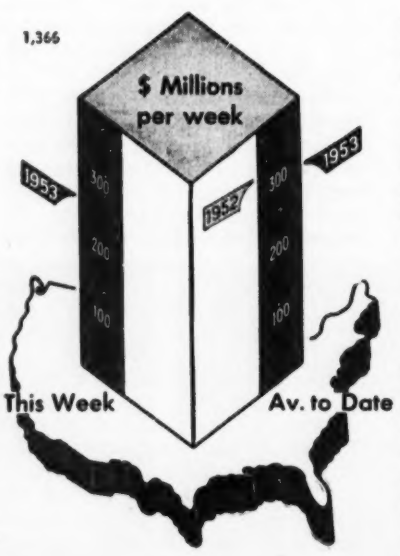
• **Parking**—"Pigeonhole parking" idea (ENR Aug. 13, p. 92) gets another boost. G. M. McKelvey Co. will build a garage in Youngstown, Ohio, following the design worked out by Pigeonhole Parking, Inc., of Spokane, Wash. The automatic garage, which will have 332 car spaces, is estimated to cost $225,000.

• **Merger**—Koehring Co., Milwaukee, manufacturer of construction equipment, is offering to buy the outstanding shares of Waterous, Ltd., of Brantford, Ont., which also makes construction machinery. This is Koehring's first attempt to spread its manufacturing operations to Canada. If successful, in acquiring Waterous, it will sell off the Canadian firm's western interests and use the proceeds from the sale for the expansion of operations at Brantford.

• **Titanium**—Production will be boosted substantially by a new plant with a capacity of 6,000 tons of ingots a year, to be built by Crane Co. of Chicago. The plant will be financed by the Defense Materials Production Administration, which will buy most or all of the output during the next five years. At first most of the titanium will go to the Air Force, but later Crane will go into production of valves and fittings.

Activity This Week

As reported to ENR
(in millions of dollars)



Amount of contracts let

	This Week	Cumulative 34 wks 1953	1952	% chge
Federal	$23.7	$1,044.5	$3,707.7	−72
State and Municipal	81.2	3,294.1	2,790.3	+18
Total pub.	104.9	4,338.6	6,498.0	−33
Total priv.	154.2	5,793.0	4,451.9	+30
U. S. Total	**$259.1**	**$10,131.6**	**$10,949.9**	**−7**

Contracts by type of work

Waterworks	$3.2	$153.8	$152.1	+1
Sewerage	7.1	267.4	191.4	+40
Bridges	17.2	477.6	254.4	+88
Highways	19.3	1,174.3	1,013.2	+16
Earthwork, Waterways	4.7	275.5	343.2	−20
Buildings: Public, excl. hsg.	30.2	1,126.1	3,520.9	−68
Housg., pub.	12.1	300.8	486.0	−38
Housg., priv.	52.6	2,426.9	1,976.2	+23
Commercial	14.2	825.8	398.9	+107
Industrial	32.7	1,865.4	1,741.3	+7
Unclassified	65.8	1,238.0	872.3	+42
Total	**$259.1**	**$10,131.6**	**$10,949.9**	**−7**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes		1953	Base Years = 100 1913	1926	1949
Construction cost	Aug	611.87	294.13	128.27	
	Jul	604.10	290.39	126.64	
Building cost	Aug	437.05	236.26	124.24	
	Jul	435.28	235.19	123.73	
Volume	Jul	447	182	129	

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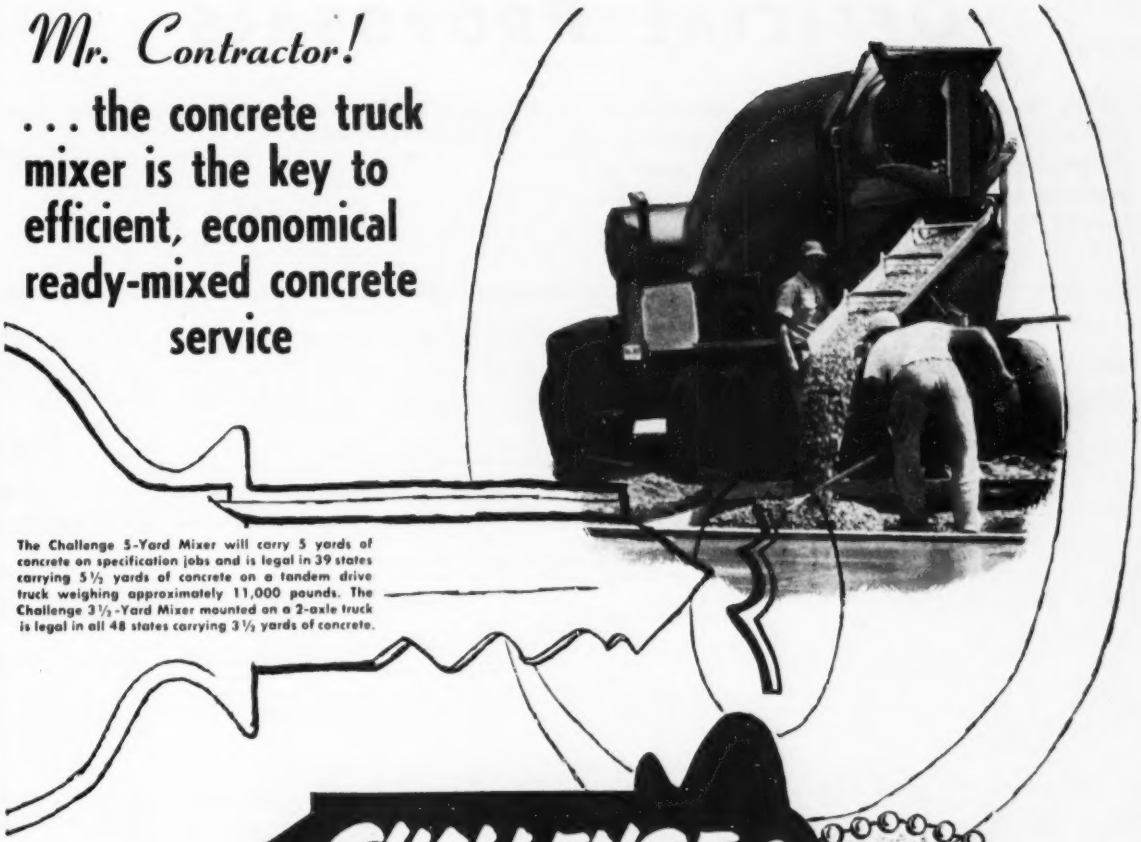

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- **CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.**

- **SEND COPY TO: Official Proposal Div. Engineering News Record 330 W. 42nd Street New York 36, N. Y.**

Bids: September 3, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 3rd day of September 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, District Engineer, 353 Broadway, Albany, New York				
Rensselaer	FASS 53-10	Petersburg Junction-Hoosick Co. Rd.; Proj. S-385(1)	1.73	T. C. Bit. Mac. (Pen. Method) Type 1	$8,000 Plans $10	$144,000
Schenectady	U.S. 88	Lock 7, Barge Canal, Niskayuna	.....	Extending Upper Lock Gate, Removing and Replacing Lower Lock Gate and Misc. Work	5% of Bid Plans $10	Not Published
		DISTRICT No. 2				
		LACY KETCHUM, District Engineer, 109 No. Genesee St., Utica, New York				
Herkimer	M.T. 53-13	New York State Thruway—Mohawk Sect.-Sub. 10B (East Schuyler-Fort Herkimer)	0.22	9" Cem. Conc. Pavt. 2 @ 25' Wide Hy. R.R. Comp. Girder and I-Beam 776.4'	$130,000 Plans $25	$2,338,000
Hamilton	FASSH 53-11	Speculator-Indian Lake Pt. 1; Proj. S-503(3)	10.66	D.S.T. Graded Grav. Comp. I-Beam Br. 55'	$100,000 Plans $50	1,854,000
		DISTRICT No. 6				
		J. H. THOMAS, District Engineer, 30 West Main St., Hornell, New York				
Allegany	FASS 53-11	Knights Creek-Scio Co. Rd. 9; Scio-Vandermark Creek Co. Rd. 10; Proj. S-789(3)(4)	1.10	Bit. Mac. Ty. 1 Pen. Method 4 Comp. I-Beam Brs. 92', 100', 146.5' and 160'	$31,000 Plans $25	604,000
		DISTRICT No. 9				
		F. W. DONOVAN, District Engineer, 71 Frederick St., Binghamton, New York				
Otsego	Chp. 23 Sec. 10 Laws 1953 Chp. 103 Sec. 11 Laws 1945	County Assistant Engineers' Storehouse and Office	.....	Chain Link Fence and Gates, Grading, Drainage, Driveways and Landscaping	$1,700 Plans $10	31,000
		DISTRICT No. 10				
		M. GOUL, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., New York				
Bronx	FACBE 53-1	Cross Bronx Expressway Contract 6A (3rd Ave. El. R.R.); Proj. UI-1084(1)	0.20	Raising Exist. R.R. Structure. R.R. Sep. Thru Girder 94.7'	$60,000 Plans $15	1,131,000
Nassau	FARC 53-110 SS 53-13	North Hempstead Turnpike S.H. 9018; Middle Neck Road S.H. 9019; Old Middle Neck Rd. Co. Rd. 251; Proj. U-541(9)	1.48	Drainage and Misc. Work	$25,000 Plans $10	462,000
Suffolk	FARC 53-111	Sag. Harbor Village S.H. 1206; Proj. F-859(2)	1.41	Asp. Conc. Ty. 1A, Opt.	$13,000 Plans $10	233,000
Suffolk	FASS 53-12	Hauppauge-Nesconset Co. Rd. 85; Proj. S-349(2)	4.69	Asp. Conc. Ty. 1A, Opt. = 4.49 Mi. 9" Cem. Conc. Pavt. Var. Wide = 0.20 Mi.	$60,000 Plans $15	1,120,000

Maps, plans, sepcifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York. Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Official Proposals Columns
of ENGINEERING NEWS-RECORD

are MUST reading, each week, for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States.

. . . and used regularly for over 50 years by government, state, county and municipal departments for advertising bids.

Official Proposal Division
ENGINEERING NEWS-RECORD
New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: September 1, 1953

Route 44 (1927) U. S. 130 (1953), Sections 16B and 8A

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route 44 (1927) U. S. 130 (1953), Sections 16B and 8A, Paving, from Repaupo Road to Raccoon Creek, Logan Township, Gloucester County, Federal Aid Project No. F-122(14). Length 2.502 miles. The principal items of construction are:

Estimated:

19,758 cu. yds. Roadway Excavation-Earth
25,409 cu. yds. Borrow Excavation
29,560 cu. yds. Subbase
31,959 sq. yds. Macadam Base Course, 6" thick
31,623 sq. yds. Pavement Type MA-BC-2, 3" thick
67,979 sq. yds. Conc. Pavement Surf., Rein., 9" thick
1,258 lin. ft. Rein. Conc. Culvert Pipe
541 lin. ft. Corrugated Metal Culvert Pipe
21 Inlets
21,986 lin. ft. White Concrete Curb
4,294 lin. ft. Wire Rope Fence
8,041 lin. ft. 3" W. I. Pipe Conduit

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, September 1, 1953, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the revised statutes of New Jersey and supplements, and by P. L. 413, 82nd Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 21 Delaware Street, Woodbury, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000, and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: A. Lee Grover, Chief Clerk
State Highway Department

OFFICIAL PROPOSALS

Bids: September 9, 1953

Sale of Fabricated Structural Steel

NOTICE TO BIDDERS
Contract M-6B

Sealed proposals will be received by the Ohio Turnpike Commission for the sale to the Ohio Turnpike Commission of fabricated structural steel and other appurtenant steel items in accordance with Contract M-6B.

The performance required under Contract M-6B consists of the sale, including delivery, of fabricated structural steel and appurtenant steel items for seven twin and fifteen single bridge structures of from three to five spans each in Construction Sections 17, 18 and 19 in Design Section D-6 of Ohio Turnpike Project No. 1 in Cuyahoga County. Hand rails, steel piles, scupper castings and gratings and anchor bolt assemblies are not included in the items to be furnished.

Approximate quantities of the items in Contract M-6B are as follows:
Fabricated Structural Steel 8,645,000 pounds
Structural Expansion and/or Contraction Joints 316,300 pounds

Copies of the Plans for said Contract, and of the General Specifications for Ohio Turnpike Project No. 1, a part of which constitute Specifications applicable to this Contract, are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, which sums are non-returnable:
General Specifications for Ohio Turnpike Project No. 1..... $ 5.00
Plans 15.00

Forms or copies of all remaining Contract Documents, including the Proposal; the Affidavit which must accompany the Proposal; this Notice to Bidders; the Special Provisions, which specify, among other things, which of the aforesaid General Specifications apply to Contract M-6B; the Contract to be entered into with the successful Bidder; and the Contract Bond to be furnished with such Contract will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office on and after August 7, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each Proposal must be accompanied by a certified check on a solvent bank, payable to the order of the Ohio Turnpike Commission, in an amount not less than 5 percent of the total amount bid in such Proposal. Said certified check will be held by the Commission as a guarantee that, if the Proposal is accepted, a contract will be entered into and the performance of the Proposal will be secured. Each such check, or the proceeds thereof, will be returned or forfeited as provided in paragraph G-3.03 and G-3.06 of the aforesaid General Specifications.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, September 9, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all Proposals will be publicly opened and read.

The award of the Contract, if any award be made, will be to the bidder whose Proposal is lowest and best and complies with all the prescribed requirements. The Commission reserves the right to reject any or all proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

Bids: September 9, 1953

Contract M-14A

NOTICE TO BIDDERS

Sealed proposals will be received by the Ohio Turnpike Commission for the sale to the Ohio Turnpike Commission of fabricated structural steel and other appurtenant steel items in accordance with Contract M-14A.

The performance required under Contract M-14A consists of the sale, including delivery, of fabricated structural steel and other appurtenant steel items for six twin and eight single bridge structures of from one to five spans each, in Construction Sections 39 and 40 in Design Section D-14 of Ohio Turnpike Project No. 1 in Sandusky County. Handrails, steel piles, scupper castings and gratings and anchor bolt assemblies are not included in the items to be furnished.

Approximate quantities of the items in Contract M-14A are as follows:
Fabricated Structural Steel 3,425,000 pounds
Structural Expansion and/or Contraction Joints 219,000 pounds

Copies of the Plans for said Contract, and of the General Specifications for Ohio Turnpike Project No. 1, a part of which constitute Specifications applicable to this Contract, are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, which sums are non-returnable:
General Specifications for Ohio Turnpike Project No. 1..... $ 5.00
Plans 15.00

Forms or copies of all remaining Contract Documents, including the Proposal; the Affidavit which must accompany the Proposal; this Notice to Bidders; the Special Provisions, which specify, among other things, which of the aforesaid General Specifications apply to Contract M-14A; the Contract to be entered into with the successful Bidder; and the Contract Bond to be furnished with such Contract will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office on and after August 7, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each Proposal must be accompanied by a certified check on a solvent bank, payable to the order of the Ohio Turnpike Commission, in an amount not less than 5 percent of the total amount bid in such Proposal. Said certified check will be held by the Commission as a guarantee that, if the Proposal is accepted, a contract will be entered into and the performance of the Proposal will be secured. Each such check, or the proceeds thereof, will be returned or forfeited as provided in paragraph G-3.03 and G-3.06 of the aforesaid General Specifications.

All bids must be received at or before 10:00 A. M., Eastern Standard Time, September 9, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all Proposals will be publicly opened and read.

The award of the Contract, if any award be made, will be to the bidder whose Proposal is lowest and best and complies with all the prescribed requirements. The Commission reserves the right to reject any or all proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

Bids: September 3, 1953

Woven Wire Window Guards

THE PORT OF NEW YORK AUTHORITY
TEMPORARY TERMINAL BUILDING AND EMERGENCY FIRE HOUSE
NEW YORK INTERNATIONAL AIRPORT
CONTRACT O & M—202
PROPOSAL NO. 212

Sealed proposals for furnishing all labor, material and equipment necessary for installation of woven wire window guards, New York International Airport, Jamaica, N. Y., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A.M. (E.D.S.T.) on Thursday, September 3, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

READ THE OFFICIAL
PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

Excavation Work

NOTICE TO CONTRACTORS

Sealed Proposals for the construction of Contract No. 2 of the Village Creek Sewage Treatment Plant will be received by the Jefferson County Commission, Jefferson County, Alabama, at the Jefferson County Court House, Commission Chamber until 10:00 A.M. o'clock C.S.T. on September 22, 1953 at which time and place they will be publicly opened and read.

Plans, specifications, and contract documents are open to public inspection at the office of C. J. Rogers, County Engineer, Room 206, Courthouse, and at the offices of J. W. Goodwin Engineering Co., 2111 7th Ave. South, Birmingham, Alabama, or maybe obtained from J. W. Goodwin Engineering Company, upon deposit of $100.00. The full amount of deposit for one set of documents will be refunded (with deductions not exceeding the actual cost of the documents) upon return of all documents in good condition within three (3) days after the date of opening of bids.

The work to be constructed hereunder consists principally of the following approximate quantities:

PROPOSAL

36,000 C.Y. Special Excavation; 11,000 C.Y. Earth Excavation; 500 C.Y. Foundation Backfill; 22,000 C.Y. Rock Excavation; 1,500 C.Y. Slag Leveling Course; 500 C.Y. Class "B" Concrete; 1 L.S. Yard Piping; 1,500 C.Y. Slag Backfill for Pipe; 1,500 C.Y. Special Pipeline Excavation; 1 L.S. Plant Storm Sewer System; 1 L.S. Intercepting Storm Sewer; 1 L.S. Sanitary Sewer and Structures; 1 L.S. Air Supply System; 1,585 S.Y. Type "A" Waterproofing; 6,800 S.Y. Stabilized Macadam Base; 6,800 S.Y. Bituminous Plant Mix; 4,875 L.F. Combination Concrete Curb and Gutter; 700 S.Y. Concrete Sidewalk; 45,000 C.Y. Yard Leveling; 38,400 C.Y. Borrow Excavation; 12 Acre Ground Preparation, zone "B"; 5,000 C.Y. Slope Flushing Material; 3,600 C.Y. Loamy Topsoil for Zone "A"; 4,000 C.Y. Loamy Topsoil for Cut and Fill Slopes; 18.90 Acre Seeding; 3,500 M. Gal. Watering; 23,000 S.Y. Solid Sodding; 23,000 S.Y. Dry Rip-Rap; 23,000 S.Y. Grouted Rip-Rap; 4,750 L.F. Fence; 1 L.S. 40 M.G.D. Sewage Treatment Plant.

A Performance Bond will be required of the successful bidder in the amount of 100% of the contract price. A Labor and Material Bond will be required of the successful bidder in the amount of 50% of the contract price.

Attention of Bidders is called to the License required by Act No. 297 of General Laws of the Legislature of Alabama, approved September 2, 1935, entitled "An Act to Regulate the Licensing of General Contractors", and that it will be necessary for all persons submitting bids for work involving Ten Thousand Dollars or more to show satisfactory evidence of license as a general contractor. No Plans, specifications or proposal forms herein will be issued to other than licensed general contractors or their authorized agents.

Bids must be accompanied by a certified check or Bidder's Bond in an amount not less than five (5) percent of the base bid.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty days.

The Owner reserves the right to reject any and all bids, and to waive informalities.

JEFFERSON COUNTY COMMISSION
By: W. D. Kendrick, President
Attest: T. S. Lucius, Chief Clerk
J. W. GOODWIN ENGINEERING CO.
2111 7th Avenue South
Birmingham, Alabama

Bids: September 18, 1953

Improvements to Sanitary Sewerage System

Sealed bids will be received by the Salisbury Incinerator and Sewage Treatment Plant Commission at the City Hall, Salisbury, Maryland, until 2:00 P.M., E.D.T., Friday, September 18th, 1953, for furnishing all labor, materials, and equipment and performing all work necessary for the construction of proposed improvements to Salisbury's sanitary sewerage system in accordance with the following schedules:

Schedule A. All work in connection with the construction of the trunk and related lateral sewers; north side pumping station and force main; part of plant effluent line; chlorine contact tank; and outfall sewer.

Schedule B. All work in connection with the construction of the south side pumping station and force main; water main extensions; and units of the treatment plant required for primary treatment, namely, the detritor, clariflocculator, sludge digesters, sludge drying beds, and control building.

Schedule C. All work in connection with the construction of the secondary treatment units, namely, the biofilters and final clarifier.

Schedule D. All work in connection with the construction of Schedule A and Schedule B on an all or none basis.

Schedule E. All work in connection with the construction of Schedule A, Schedule B, and Schedule C on an all or none basis.

Copies of the contract documents may be examined at the office of Col. Ernest L. McLendon, Executive Secretary to the Mayor of Salisbury, located in the City Hall, or may be obtained from the office of Clarke Gardner and Percy Sterling, Consulting Engineers, Calvert and Bond Streets, Salisbury, Maryland, upon deposit of $35.00 for each set. If the documents are returned in good order within 15 days after the opening of bids, the full amount of the deposit for one set will be returned to each actual bidder. The deposits of actual bidders for additional sets, and of non-bidders of all categories will be refunded with a deduction of $25.00 per set to defray the reproduction cost of the documents. No deposit or any portion thereof will be refunded if the documents are not returned within the time stated.

To be considered, bids must be submitted on the basis of Schedule A and/or Schedules B and C. Bidders may bid on Schedules D and/or E at their option.

Each bid under Schedule A and/or Schedules B and C must be accompanied by a certified check or bid bond in an amount not less than 5% of the total of the schedule or schedules bid. If the bidder elects to submit a bid under Schedule D and/or Schedule E, a certified check or bid bond in an amount not less than 5% of the total of the highest schedule bid must be furnished; but, under these circumstances, no certified check or bid bond will be required for Schedules A and/or B and/or C.

An approved surety bond in the amount of 100% of the contract price will be required from the successful bidder or bidders to insure the faithful performance of the work.

No bidder may withdraw his bid within 45 days after the actual date of the bid opening.

The Commission reserves the right to consider informal any bid not prepared and submitted in accordance with the provisions of the contract documents, and may waive any informalities in or reject any and all bids.

SALISBURY INCINERATOR AND SEWAGE TREATMENT PLANT COMMISSION
Fred A. Grier, Jr., Chairman

August 4th, 1953

Bids: September 1, 1953

Highway Construction

REPUBLIC OF LIBERIA
DEPARTMENT OF PUBLIC WORKS AND UTILITIES
DIVISION OF HIGHWAYS
MONROVIA, R. L.

STANDARD GOVERNMENT FORM OF INVITATION FOR BIDS. FORM NO. 20.

SEALED BIDS, in single copy only, subject to the conditions contained herein, will be received until 11 o'clock A.M., Monrovia time, on the 1st. day of September, 1953, and then publicly opened at that time, at the office of the Secretary of the Department of Public Works and Utilities, for furnishing the materials and performing the work for constructing the Liberia, Monrovia-Kakata Project 1-B in Montserrado County, R. L. Telegraphic bids will not be accepted. Bids received after the above time and date will not be considered. The length of the Project is 23.375 miles, and the items of work are approximately as follows:

20(1)	Clearing and Grubbing	160 Acres.
24(1)	Unclassified Excavation, (of which approximately 35,000 cu. yds. are solid rock.)	535,000 Cu. Yds.
25(1)	Unclassified Excavation for Structures	5,000 Cu. Yds.
27(2)	Overhaul. (1000-ft. Freehaul	605,000 Sta. Yds.
30(1)	Foundation Fill	425 Cu. Yds.
37(1)	Furrow Ditches	73,000 Lin. Ft.
38(1)	Obliteration of Old Roadway	685 Units
45(1)	Watering Embankments	17,000 Units
45(5)	Provide Water Plant	Lump Sum
46(1)	Rolling of Embankment	2,700 Hours
46(5)	Provide Rollers	Lump Sum
47(1)	Rolling Base Course	950 Hours
51(1)	Stabilized Soil Base Course	127,000 Cu. Yds.
110(7)	Bituminous Prime Coat, Emul. Asphalt	138,000 Gal.
112(2)	Blotter Mtl. for Bitum. Preserv. Trtmt.	6,200 Cu. Yds.
112(16)	Emul. Asphalt for Bitum. Preserv. Trtmt.	184,500 Gal.
206(1)	Concrete, Class A.	1,600 Cu. Yds.
206A(6)	Concrete, Class Y	5 Cu. Yds.
207(1)	Reinforcing Steel	152,000 Lbs.
221(1)	Clean, Paint Struct. Steel in place	Lump Sum
249(1)	Concrete Block Headwalls	335 Cu. Yds.
250(1)	18" Std. Str. Reinf. Conc. Pipe Culvert	1,263 Lin. Ft.
250(2)	24" Std. Str. Reinf. Conc. Pipe Culvert	2,739 Lin. Ft.
250(3)	30" Std. Str. Reinf. Conc. Pipe Culvert	540 Lin. Ft.
250(4)	36" Std. Str. Reinf. Conc. Pipe Culvert	2,928 Lin. Ft.
250(5)	48" Std. Str. Reinf. Conc. Pipe Culvert	162 Lin. Ft.
323(1)	Grouted Rubble Gutter	2,200 Sq. Yds.
406(1)	Reinforced Concrete Slope Pavement	330 Sq. Yds.

The Government of the Republic of Liberia through the Department of Public Works and Utilities will furnish, at established rental rates, any available government-owned construction equipment on hand for use at the contractor's option. Rental accruing to the Government may be deducted from partial payments made to the contractor. Small tools, drill steel, bits, etc. are to be furnished by the contractor. Nothing in this Invitation, or in the Contract, shall preclude the use by the contractor of his own equipment.

The Government will permit the contractor to import duty free, any supplies or materials incorporated in the work, or equipment used on the work. The contractor will furnish all materials and supplies incorporated in the work unless specific mention is made in the Special Provisions or Invitation to the contrary. Supplies or materials not of Liberian or United States origin or manufacture shall not be used on this project without the written consent of the Secretary of the Department of Public Works and Utilities. Preference of employment in all categories shall be given to qualified Liberian and United States citizens, but only Liberian citizens may be employed as Unskilled Labor, except upon written permission of the Secretary of the Department of Public Works and Utilities. Any qualified firm, company, partnership, corporation or individual may submit a bid to perform this work, regardless of where incorporated or licensed, however, before an award will be made, the bidder must be incorporated in either Liberia or the United States. If the bidder is not incorporated in Liberia or the United States at the time of opening of bids, and becomes the low bidder, and is otherwise qualified to receive the award, the bidder must become incorporated either in Liberia or the United States within thirty (30) days of the date on which the Secretary of the Department of Public Works and Utilities issues notice of intent to award.

Bids: September 8, 1953

Holland Tunnel

THE PORT OF NEW YORK AUTHORITY
PAVING, UTILITIES, FOUNDATIONS AND CANOPY FOR TOLL BOOTH AREA
CONTRACT HT-130.001

Sealed proposals for paving and the furnishing and installation of utilities, foundations and canopy for the toll booth area at the New Jersey Plaza of the Holland Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, September 8, 1953, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1110, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, August 20, 1953

OFFICIAL PROPOSALS

Bids: September 4, 1953

Delaware River Joint Toll Bridge Commission

ADMINISTRATION BUILDING
MORRISVILLE, PENNSYLVANIA
NOTICE TO CONTRACTORS

Sealed proposals for "Painting Steel" of three structural steel highway bridges over the Delaware River, between Pennsylvania and New Jersey located as follows:

CONTRACT NO. 108 DELAWARE WATER GAP BRIDGE approximately one mile upstream from the Point of the Gap, in the vicinity of the town of Delaware Water Gap, Pennsylvania.

CONTRACT NO. 208—PORTLAND-COLUMBIA BRIDGE approximately 1,400 feet downstream from the existing covered bridge between Portland, Pennsylvania and Columbia, New Jersey.

CONTRACT NO. 308—MILFORD-MONTAGUE BRIDGE approximately 1,600 feet downstream from the existing bridge between Milford, Pennsylvania and Montague, New Jersey.

will be received by the Delaware River Joint Toll Bridge Commission at its office, Administration Building, Morrisville, Pennsylvania, until eleven o'clock (11:00 a.m.), Eastern Standard Time, on the 4th day of September 1953, at which time and place all bids will be publicly opened and read aloud.

PAINT AND THINNERS ARE TO BE FURNISHED BY THE COMMISSION.

"Painting Steel" includes the following work:

1. Clean all steel as necessary for painting.
2. Apply touch-up coat of paint to all areas where shop coat is missing or damaged.
3. Apply three (3) field coats of paint to all steel.
4. Clean rust stains from the concrete and granite facing of the piers and from the face of the abutments.

The DELAWARE WATER GAP BRIDGE has approximately 5,690 tons of steel to be painted with thirty-one piers and two abutments to clean.

The PORTLAND-COLUMBIA BRIDGE has approximately 1,530 tons of steel to be painted with nine piers and two abutments to clean.

The MILFORD-MONTAGUE BRIDGE has approximately 1,270 tons of steel to be painted with three piers and two abutments to clean.

After August 17, 1953, Instructions to Bidders, Form of Proposal, Form of Contract, Form of Performance Bond, and Specifications may be examined at the offices of the Commission, Morrisville, Pa., or Administration Building, Phillipsburg, New Jersey, and copies thereof obtained upon payment of five dollars ($5.00) for each set (the set contains the documents for the three bridges) which amount is not returnable.

Proposals may be submitted for the painting of each bridge separately, for two bridges combined or for all three bridges combined.

Each Proposal must be accompanied by a certified check in the amount of not less than five (5) percent of the amount of the Proposal.

If the bidder submits Proposals for more than one contract, a single certified check in the amount of not less than five (5) percent of the largest value of work included in a combination of proposals, will be sufficient.

All checks shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been awarded the contract, to enter into a written contract with the Commission in accordance with the accepted bid, and to give a Peformance Bond satisfactory to the Commission, equal to one hundred percent (100%) of the amount of the contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be the most advantageous.

DELAWARE RIVER JOINT TOLL BRIDGE COMMISSION
By Alexander R. Miller
Chairman of Commission

Date: August 14, 1953

U. S. Government

Department of Commerce, Bureau of Public Roads, August 4, 1953. SEALED BIDS will be received at the office of the U. S. Forest Service, Post Office Building, East Tawas, Michigan, until 11:00 a.m., C.S.T., SEPTEMBER 11, 1953, for Michigan Forest Highway Project No. 1-A, Iosco County, Michigan. Length—14.441 miles. Grading, Draining, Plant Mix Bituminous Surfacing and other work from about ¾ mile west of Oscoda to Lumbermen's Monument. The approximate quantities of the more important items are: 110,000 cu. yd. Excavation, 45,000 cu. yd. Crushed Gravel or Crushed Stone Base Course and 17,500 tons Plant Mixture. Minimum wage rates have been fixed as required by law. Plans, specifications, and proposal forms may be obtained at the address given above or at the Bureau of Public Roads, 214 Globe Building, 4th and Cedar Streets, St. Paul, Minnesota, or at the Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia. H. J. Spelman, Division Engineer.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4016) will be received at Goleta, California, until 10 a.m., PST, September 29, 1953, for furnishing labor and materials for earthwork, pipe lines, and structures, Lateral 17, Goleta Distribution System, Cachuma Project, California. Location: Santa Barbara, Santa Barbara County, California. Principal items are: Excavation and backfill, 26,700 cu. yds.; furnishing and installing steel pipe, fittings, and accessories for laterals—lump sum; furnishing and installing 40 fire hydrants; and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, Goleta, California; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

OFFICIAL PROPOSALS

Bids: September 3, 1953

THE CENTRAL RAILROAD COMPANY OF NEW JERSEY
GRADE CROSSING ELIMINATIONS THROUGH DUNELLEN AND PLAINFIELD, NEW JERSEY
UNDER ORDER OF THE PUBLIC UTILITY COMMISSION, STATE OF NEW JERSEY

Sealed proposals will be received by The Central Railroad Company of New Jersey, at the office of the Chief Engineer, located at Jersey City Terminal, Room No. 44, Foot of Johnston Ave., Jersey City, N. J., until 1:00 P.M., Thursday, September 3, 1953, and publicly read at that time, for the:—

Furnishing and erection of structural steel for four railroad bridges, i.e. Rock Avenue, Plainfield, Union County; Washington Avenue, Prospect Avenue and Madison Avenue, Borough of Dunellen, Middlesex County, New Jersey.

Principal quantities involved are:—
1,289,600 lbs. Carbon Structural Steel
162,800 lbs. Silicon Structural Steel
39,000 lbs. Steel Castings
1,230 lbs. Bronze Plates

Proposal forms, drawings, specifications, bond and insurance requirements may be obtained at the office of the Chief Engineer of the Railroad Company, at the above address, on or after August 21st, 1953.

The Railroad Company reserves the right to reject any or all proposals.

S. L. Mapes, Chief Engineer,
The Central Railroad Company of New Jersey, Jersey City Terminal, Jersey City 2, N. J. August 7, 1953.

Bids: August 26, 1953

Construction of a Stone Jetty

NOTICE TO CONTRACTOR

Sealed Proposals for construction of a stone jetty will be received by the Purchasing Authority of the Town of Fairfield, in the Town Hall, 611 Old Post Road, Fairfield, Connecticut until 3:30 P.M. d.s.t. August 26, 1953, and then publicly opened and read. No proposal will be accepted after said hour.

Information for Bidders, Proposal forms, Specimen Agreement, Plans and Specifications and copies or specimens of all pertinent documents may be examined at the office of the Purchasing Authority, Town Hall and at the office of the Town Engineer, 608 Jennings Road, Fairfield, Conn. between the hours of 10 A.M. and 4 P.M. daily except Saturdays, Sundays and Holidays.

A bid bond in the amount of 10% of bid must be submitted by the bidder with his bid as a guarantee that, in case the contract is awarded to him he will, within ten days thereafter, execute such contract, and furnish a satisfactory Performance Bond and Labor and Material Bond.

The Town of Fairfield reserves the right to reject all bids. Bids which are irregular in form, incomplete, conditional or qualified may be disregarded and rejected as improper except that the Purchasing Authority may waive any defects or irregularities.

Purchasing Authority—Town of Fairfield
By: Dimill L. Kinnie, First Selectman

OFFICIAL PROPOSALS

September 11, 1953

Constr. of Relief and Reinforcing Sewers

NOTICE TO BIDDERS

The City of Erie, Pennsylvania, will receive sealed Proposals for the construction of Relief and Reinforcing Sewers until 2:00 P. M. Eastern Daylight Savings Time, on the 11th day of September, 1953 at the City Council Chambers, Erie, Pennsylvania. Copies of documents, including plans and specifications required for review or bidding purposes may be obtained only from the City Engineer by depositing $10.00 for proposed Division B, $10.00 for proposed Division C, $10.00 for proposed Division D, $10.00 for proposed Division E, and $10.00 for proposed Division F at the office of the City Engineer for each set of documents so obtained.

The full amount of the deposit for one set of documents and one-half of the deposit for any additional sets of documents will be refunded to each bidder who submits a formal proposal to the City of Erie and who also returns the plans (and specifications on additional sets) in good condition to the City Engineer within ten (10) days after his bid security has been returned to him.

A certified check or bank draft drawn on a solvent bank payable without condition to the City of Erie, Erie, Pennsylvania, or a satisfactory bid bond executed by the bidder and a surety company in an amount not less than ten per cent (10%) of the bid, shall be submitted with each Proposal.

DIVISION B—Miscellaneous Relief Sewers West Section:
Approximately 17,900 lineal feet of reinforced concrete and vitrified tile pipe sewers in sizes ranging from 6" to 42" and appurtenances.

DIVISION C—Plum, Liberty, West 38th Streets Relief Sewers:
Approximately 26,200 lineal feet of reinforced concrete and vitrified tile pipe sewers in sizes ranging from 6" to 36" and appurtenances.

DIVISION D—West Side Relief Interceptor:
Approximately 9,200 lineal feet of reinforced concrete and vitrified tile pipe sewers in sizes ranging from 6" to 54", alterations to existing chambers and appurtenances.

DIVISION E—Ash-Wallace Street Relief Sewer:
Approximately 21,000 lineal feet of reinforced concrete and vitrified tile pipe sewers in sizes ranging from 6" to 66", special reinforced concrete diversion chamber and appurtenances.

DIVISION F—Miscellaneous Relief Sewers —Central Section:
Approximately 9,750 lineal feet of reinforced concrete and vitrified tile pipe sewers in sizes ranging from 6" to 60", approximately 1,410 lineal feet of cast iron pipe, special reinforced concrete chambers and appurtenances.

Plans and specifications for this project were prepared by Consoer, Townsend & Associates, Consulting Engineers, 351 East Ohio Street, Chicago 11, Illinois, and 717 Liberty Avenue, Pittsburgh 22, Pennsylvania.

Dated at Erie Pennsylvania
This 11 day of August, 1953
CITY OF ERIE, PENNSYLVANIA
FRED A. GORENFLO
City Engineer

OFFICIAL PROPOSAL

RATE: $1.00 per line (or fraction) per insertion.

CLOSING DATE: 12:00 p.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.50 a line an insertion.

INFORMATION:
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $17.10 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York City Office, 330 W. 42nd St., N. Y. 36 for September 3rd issue closing August 22nd.

ENGINEERS AND DESIGNERS

With experience applicable to Oil Refinery, Blast Furnace or Steel Plant Design.

Openings available at our Cleveland, Ohio offices for:

Piping Designers
Structural Designers
Concrete Designers
Pressure Vessel Designers
Instrument Specifications Engineers

These openings offer:

Top Hourly Rates
Permanent Positions
Overtime—45 hour week
No Age Limitations

Write, giving complete background and experience to:

ARTHUR G. McKEE & CO.
2300 Chester Ave.
CLEVELAND 1, OHIO

ESTIMATORS

Fully experienced in industrial and commercial buildings and mechanical installations (machinery, equipment, piping, etc.)

These openings in Cleveland Office offer excellent working conditions with paid vacations, sick leave and participating group insurance program. Presently working scheduled 5 day 45 hour work week.

Replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete resume stating experience, education, salary required and date available to

THE H. K. FERGUSON COMPANY
Engineers and Builders
Ferguson Building Cleveland 14, Ohio

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED PLANT Supt by established Southern manufacturer of Structural Precast Concrete Products. Specializing in Floor and Roof systems. Annual Sales well over one million dollars. State age, experience, availability, salary and full particulars first letter. P-8706, Engineering News-Record.

ESTIMATOR OR Cost Engineer, age 35 to 45, graduate of recognized university, with 10 years practical experience, preferably hydroelectric projects. Supervisory position, with small staff, reporting and analysing costs of jobs, assisting in preparation of estimates, budgets, etc. Location Sao Paulo, Brazil, with frequent trips to construction camps in area of Sao Paulo and Rio de Janeiro. Apply Dept. NP, Canadian-Brazilian Services Limited, Gerrard Building, Toronto, Canada.

WANTED—SEWER Foreman, experienced. Big job and high wages. E. A. Meyer Const. Co., 1539 Morrow Ave., North Chicago, Ill.

VALUATION ENGINEER — Wanted by large corporation operating nationally, for establishing and maintaining insurable values of its various plants. Permanent staff position. Location Northeastern Ohio. Salary open. Reply P-8749, Engineering News-Record.

WANTED — EXPERIENCED estimator for building construction for long established Pittsburgh Contracting Company. Good opportunity for advancement. Reply to P-8759, Engineering News-Record.

WANTED — MECHANIC, familiar with all types of heavy road equipment. Some ability to operate same. Work in central New York. Good opportunity for right person. Write P-8809, Engineering News-Record.

GRADE FOREMAN — Familiar with rock, heavy excavation. Good opportunity. Work in Central New York State. Experience, references. P-8810, Engineering News-Record.

CARPENTER FOREMAN — Familiar with all types of bridge work. Good opportunity with good concern. P-8811, Engineering News-Record.

INSTRUCTOR, AGE 25 to 30, to teach Hydraulics and related subjects. Opportunity for developing outside consulting practice. Salary and rank based on applicants qualifications. Location in Pennsylvania. P-8886, Engineering News-Record.

DETAILER-CHECKER: Permanent position for experienced structural steel man; pleasant working conditions, paid vacation, hospitalization, life, sickness and accident insurance. Mr. Detrick, Acorn Iron Works, 9260 Freeland, Detroit 28.

WANTED EXPERIENCED designer, with proven record in development of air actuated percussive tools as used in mining and construction industries. Also junior engineers with design aptitude to enter the engineering departments. Location—New York State. Apply, listing experience in full to P-8847, Engineering News-Record.

ENGINEER AND Estimator experienced in all phases of bridge, highway and heavy construction. Excellent opportunity. Top salary and bonus. Permanent position with established Ohio contractor. Furnish complete details. P-8845, Engineering News-Record.

(Continued on the opposite page)

WANTED
Resident Manager
Overseas
(Pacific)

Must be capable of handling all phases of construction on a complex project. Administrative ability in operation procedures, methods & control reports. Complete management of project during Project Manager's absence.

Forward complete resume and starting salary desired. Replies held in strict confidence. Box P-8503, Engineering News-Record 1111 Wilshire Blvd., Los Angeles 17, Calif.

ESTIMATORS

Young engineers capable of mechanical estimating for construction of refineries, steam power and similar industrial projects. Must have some field experience.

Considerable weight given to ambition, intelligence and interest in estimating and cost analysis.

BECHTEL CORPORATION
220 Bush Street
San Francisco, California

EXPERIENCED
STRUCTURAL STEEL DETAILERS
Salary Commensurate with experience.
Darbyshire Steel Co., Inc.
P. O. Box 352 El Paso, Texas

WANTED
BRIDGE SUP'T.
Vicinity—Trenton. 1st rate only. State experience, when available & salary.
P-8793, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

EXPERIENCED CHIEF ESTIMATOR:
Must have ability and be capable of directing Estimating Department of a Building Contractors organization in the Southwest.
P-8737, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

(Continued from opposite page)

CONSTRUCTION SUPERINTENDENT—Wanted for a heavy construction firm within the New York City area doing large earth and rock excavation; heavy concrete construction; sheeting; shoring and underpinning. Prefer young aggressive type who is looking for an opportunity to prove his real worth. P-8835, Engineering News-Record.

REGISTERED CIVIL Engineer General Municipal Duties, starting salary $475.00, City of National City, Calif.

GRADUATE CIVIL engineer, seven years experience, two administrative, to serve as Director of Public Works. Salary, $10,000. Two year contract. Write Personnel Department, County of Ventura, P. O. Box 1410, Ventura, Calif., for applications and information, giving education, experience and age.

CHIEF OF Party—Must be capable of handling survey parties and have thorough understanding of survey work pertaining to rights of way, curb and street lines, sanitary and storm sewer surveys, and general survey work. Apply—Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J. Phone WO 8-1200, Extension 7.

TRANSIT MAN—For inside and outside work. Must have thorough knowledge of engineering, drafting and calculating, and be thoroughly familiar with deed and conveyance, and tax map work. Apply—Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J. Phone WO 8-1200, Extension 7.

SELLING OPPORTUNITY OFFERED

SALES ENGINEERS—Albany, New York and Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. SW-8254, Engineering News-Record.

EMPLOYMENT AGENCIES

WANTED ENGINEERS, Designers, Draftsmen, Structural, Piping, M.E., C.E., E.E., and Industrial, also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

WATER AND Sanitary Engineer. Design, construction and operation. Water Waste Surveys, pump and meter tests. Have equipment for hydraulic measurements and tests. Graduate, registered, 30 years experience. PW-8816, Engineering News-Record.

GENERAL CARPENTER Foreman reinforced concrete, 19 years experience, 5 years foreign. PW-8800, Engineering News-Record.

EXECUTIVE ACCOUNTANT, presently employed desires position as Controller or equivalent in foreign construction field. Age 47, B.B.A. degree, bilingual (English-Spanish), 25 yrs. heavy experience including 7 yrs. foreign and 7 yrs. Government contracts. Excellent qualifications and references. Available 30 days notice. PW-8774, Engineering News-Record.

Available IN sixty days. Construction Superintendent for highway work, drainage, irrigation or levee work. Over twenty years experience. Can supervise, plan, and handle work of this kind on the project level. Knowledge of Engineering and thoroughly familiar with government contracts. Prefer Southern California or Arizona. Can also bring Master Mechanic who is thoroughly familiar with repairing of all makes of draglines and crawler equipment. Mechanic has his own tools. PW-8770, Engineering News-Record.

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year.
WILSON *Engineering Corp*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

POSITIONS WANTED

RESEARCH ENGINEER P.E. 25 years experience. Speciality building materials, light frames and shelters. Headed structural department 10 years. Location N. Y. City and Northern N. J. Immediately available. PW-8758, Engineering News-Record.

ESTIMATOR WITH field experience as Superintendent familiar with all types of Building Construction. Also experienced in making Engineering Estimates for Engineers. References, address E. Harold Bowen, 1108 E. Belvedere Ave., Baltimore 12, Md.

CONSTRUCTION SUPERINTENDENT: Concrete pipe manufacture, considerable experience. PW-8857, Engineering News-Record.

CIVIL ENGINEER, 29, married, Varied experience, N.Y.C. area preferably Westchester County. PW-8858, Engineering News-Record.

CONSTRUCTION MAN, with over thirty years sound experience, both buildings and heavy construction, seeks new connection as Project Manager or other executive position. Thoroughly experienced all phases of contracting, both field and office. New York City or vicinity preferred. PW-8859, Engineering News-Record.

ENGINEER, 56, B.E. & M.S. degrees, desires position in the Southwest, 25 years experience in sewage treatment. Minimum salary $6600.00. PW-8860, Engineering News-Record.

SANITARY ENGINEER — Age 39, married, M.S. degree, 7 years experience in sanitary engineering field including design, construction and administration. Desires responsible permanent position. Prefer far West. Registered CE in California. PW-8863, Engineering News-Record.

YOUNG GRADUATE Civil Engineer with Railroad and construction engineering experience desires job with non-union General Contractor; any location. Am only interested in a permanent job with a good future. PW-8861, Engineering News-Record.

PROJECT MANAGER, Resident Engineer or Superintendent. Capable organizer and cost conscious. 25 years experience on airports and highways, including the leading express highways. Grading, drainage, paving and crete structures. Available about Sept. 1st. PW-8872, Engineering News-Record.

ARCHITECT, 25 YEARS experience, graduate, registered, seeks administrative position in connection with building design, construction, management, or appraisal. PW-8562, Engineering News-Record.

CHIEF ESTIMATOR, heavy construction; bidding, administration, cost analysis; seeks permanent responsible affiliation in New York area. PW-8696, Engineering News-Record.

CIVIL ENGINEER, 31 years, French, 8 years experience in estimating, supervision and public relations, desires position in NYC. PW-8836, Engineering News-Record.

ENGINEER—15 Yrs. exp. desires position on design concrete or steel structures. Prefer part-time N.Y. or N.J. area. PW-8832, Engineering News-Record.

ARCHITECTURAL STRUCTURAL Engineer experienced in industrial and commercial design, field-supervision and estimating desires position with Architects, Engineers, or Constructors. PW-8850, Engineering News-Record.

CONSTRUCTION ENGR. C.E. Grad. Reg. Prof. Engr. 23 years construction experience, 12 of which as Supt. of Const. Know job pushing, estimating, cost control, equipment, etc. 70% Exp. heavy construction, pile driving, etc. 30% Exp. industrial construction. $200 per week. Age 40. PW-8856, Engineering News-Record.

ENGINEER, REG. P.E. Reports, of contractors' claims. 45 years experience. Design, construction. Turnpikes, tunnels, buildings, foundations, etc. PW-8746, Engineering News-Record.

WORK WANTED

PROFESSIONAL ENGINEERS with 12 years experience on Bridge Detailing and Design with State Highway Dept. Desire additional work. Located in midwest. WW-8883, Engineering News-Record.

BUSINESS OPPORTUNITY

Engineer seeks partner to establish general construction business or consider partnership in existing firm. BO-8738, Engineering News-Record.

SETTLED .
Commercial and Industrial Concrete Floors and Airport Runways Raised and Stabilized by Hydraulic Pressure.
15 yrs. experience
LEE AND COMPANY
4545 De Tonty St. Louis 10, Mo.
Lee Garell, Mgr. Mohawk 4414

FOR SALE AT SACRIFICE PRICE
NORDBERG
1,000 HP DIESEL ENGINE
Type TA-174, Four Cylinder, with complete auxiliaries such as pumps, coolers and starting air equipment.
Coupled with:
Crocker Wheeler 700 KW —DC Generator
Installed New in 1940
New Cost: $175,000
OFFERING PRICE: $15,000
NO REASONABLE OFFER REFUSED
BUILDING SOLD
ALSO:
2—Murray Engine D. C. Generating Units. Sprague 250 KW D. C. Generators with direct mounted special Corliss Engine, complete with full equipment, oil filter, gauges and wallboard.
Now In Operation
IMMEDIATE POSSESSION
Inspection Can Be Arranged By Appointment
THE WARFIELD COMPANY
(In Liquidation)
536 W. 22nd St. Chicago 16, Ill.

FOR SALE
HD-5B ALLIS CHALMERS
2 cylinder Diesel, 20" crawlers.
HYPER-HUMUS COMPANY
Newton *Phone—Newton 300* New Jersey

FOR SALE
1—Ingersoll Rand
High Pressure Air Compressor
Type 40, 4 stage, Model GC-50-BW, driven by Waukesha Gasoline Engine, 3,000 lbs. pressure, 20 CFH cap.
FS-8851, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FOR SALE
1½ yd. Lorain Shovel (1942).
Reconditioned in 1950.
Right price for quick sale.
SERAFINI CONSTR. CO., Inc.
Binghamton, N. Y. 4-2385

LOCOMOTIVE CRANE
25 Ton Browning, 8 Wheel C.S. Side Frame Trucks, Standard Gauge—Rebuilt
HENNESSEY-FORRESTAL MACHY. CO.
705 Chestnut Street St. Louis, Mo.

WANTED
ROTARY SAND DRYER
5 or 6 ft. dia. by 25-30 ft. long. Must have complete drive mechanism. For light work. Price all important.
GASCO
1506 Eastern Avenue, Kansas City, 26, Mo.

THREE REDUCED PRICE SPECIALS

(THIS WEEK ONLY)

1—34 Lad-E-Vator
***(Brand New)* . . $1125**

1—Model H Scoopmobile
***(Slightly Used)* . $4800**

1—Model 57 American Single Drum Hoist
***(Almost New)* . $1000**

(Low Prices Quoted Are F.O.B. Phila., Pa.)

ALL 3 PIECES AVAILABLE ON TERMS
WRITE OR CALL TODAY!

Telephone: TRinity 7-5200

FURNIVAL MACHINERY CO.
54th at Lancaster Avenue, Philadelphia 31, Pa.

LOCOMOTIVE, DIESEL ELECTRIC: 65 ton, 0-4-4-0. Sale or rent.
COMPRESSOR: Chicago Pneumatic O.C.E., 26" x 15" x 18", synchronous motor 400 H.P. 2300 volt. capacity 2200 CFM.
CLASSIFIERS: 6—Akins and Wemco 54" x 34' and 78" x 28½ ft., Simplex, single screw, weir type, with syncrogear motors, 220/440 volt, with lifting device. Condition like NEW, available now. Three located Nevada.
AIR SEPARATORS: Bradley 16 ft. and Sturtevant 10 ft., with or without motors.
BOOT BUCKET ELEVATORS: Buckets size 12" x 7", 40 ft. center to center, with motors and drives.
CLAM SHELL BUCKET: Blaw Knox size 7250, 2½ yd. capacity, new condition.
DIESEL MOTOR: Caterpillar D13000 portable on skids, 122 H. P.
LOCOMOTIVE CRANE: Link Belt 25 ton capacity, standard R. R. gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota.
HOISTS: Single and double drum shaft and slope Hoists 100 H.P. to 1500 H.P., complete with all electrical equipment, with or without head frames.

WE BUY AND SELL EQUIPMENT THOUGHOUT NORTH AND CENTRAL AMERICA.

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Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

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New and Used material—Immediate delivery from stock Angles, Channels, I and WF Beams, especially for Contractors needs

H BEAMS PILE SECTIONS
28 PIECES 12" BPS 53 LB. 60/70 FT.
Phone or Wire your steel requirements

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We assure you our prices will be the best obtainable.

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PORTABLE COMPRESSORS
RENT FOR 60 DAYS
TRY—THEN BUY—
RENTAL PURCHASE

60 CFM INGERSOLL (Gas) SKIDS	$ 675.00
60 CFM WORTHINGTON (Gas) 2P	$ 1250.00
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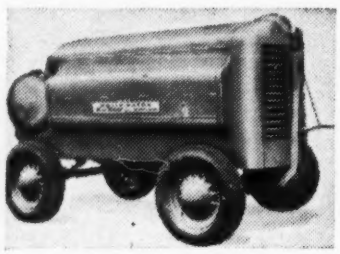
160 CFM WORTHINGTON (Gas) 4P	$ 2300.00
160 CFM WORTHINGTON (Gas) 2P	$ 2600.00
210 CFM WORTHINGTON (Gas) 4P	$ 2400.00
315 CFM WORTHINGTON (Diesel) 4P	$ 3300.00
500 CFM WORTHINGTON (Diesel) 8P	$ 7000.00
600 CFM WORTHINGTON (Diesel) 8P	$10500.00



GUARANTEED PERFORMANCE
"KNOW HOW" FOR 50 YEARS

AMERICAN AIR COMPRESSOR CO.
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UNion 5-4848

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MANITOWOC DRAGLINES Model 4500

FOR SALE or RENT

Manitowoc Model 3500 Liftcrane. Clamshell, Dragline combinations. 2½ cu. yds., 60 ton capacity.

Reply to

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FOR SALE

Koehring #34E Dual Drum Paver #19910
Lima #34 Paymaster Crane, Dragline #4831
Lorain L-50 Crane, Dragline #20440
Cat. #12 Grader #8T 1331
Cat. #12 Grader #8T 3027
Cat. #12 Grader #8T 3706
R B Finegrader S/N #405
Model 848 Barber Greene Asphalt Plant Complete
Cat. 20 KW Light Plant
Cat. D8 Tractor IH 9738
Hopkins Low Pressure Burners
Butler #250 Bbl. Cement Bin Complete

All of above equipment located in Southeast.

UNITED SOUTHERN CONTRACTORS, INC.
P. O. Box 1152 Greenville, S. Carolina

LOCOMOTIVES AND CARS

24 Magor 30 yd. steel air dump cars. Drop door type. Built 1951. Like new.

15 Western & Koppel steel air dump cars. Lift door type. 30 yd. capacity.

4 GE Diesel-elec. locomotives. 44 ton. Cat D17000 engs. New 1951. Like new.

4 GE Diesel-elec. locomotives. 25 ton. Cummins 150 HP engs. New 1950.

Mississippi Valley Equipment Co.
509 Locust St. St. Louis 1, Mo.

FOR SALE
New Wire Rope Blocks

12" Snatch Blocks with Hooks	$13.50
14" Snatch Blocks with Hooks	18.50
16" Safety Snatch Blocks with Shackles	20.00
14" Double Blocks with Shackles	13.00
18" Single 20 Ton with S. Shackle	25.00
18" 3-Sheave 30 Ton with Shackle	50.00
18" 4-Sheave 30 Ton with Shackle	75.00
#32 Drop Forge Hooks, New	2.00

ABERTHAW COMPANY
133 Southampton St. Boston 18, Mass.

SURPLUS EQUIPMENT
FOR SALE OR RENT
With Option to Purchase
Rebuilt—A1 Condition

1 48B Bucyrus Erie Shovel 2 cy diesel
1 Model 6 N.W. Shovel 1½ cy diesel
1 Caterpillar D8 Bulldozer
1 New Shovel Front for Model 6 N.W.
1 Used Shovel Front for Model 25 N.W.

WILLIAMS CONSTRUCTION COMPANY
Box 145 Balto, 20, Md. Phone—Murdock 6-6600

Walking draglines, Monighan 450W, 200W, 9W, 7W, 6W, 5W, 3T; Marion 7200; Page 625-E.
Whirley portal gantry cranes (3), 35-50 tons.
Marion 7½, 5, 4, & 2½-yd. shovels, elec., diesel.
P&H 1400 shovels; 1055 dragl.; 955 & 700 cranes.
Koehring 605 diesel 1½-yd. dragl.—cranes (4).
Derrick boats, steam, diesel, 15, 30 & 50 tons.
Locomotives, 7 to 80 tons (9), diesel, gas.
Trenchers, Buckeye 224; Parsons 310, 250.
Loco. cranes, 30 & 25-ton, gasoline & steam.
Euclid, Mack, trucks, 15, 22, 32 tons, rear.
Diesel-elec. generator sets, 1000 KW (3).
Steel stiffleg Derrick, 65 tons, elec. hoist.
Crushers, 26" & 20" gyratory, 48" x 60" jaw.
Rotary dryers, kilns, 7' x 125', 5 x 70', 72" x 47'.
Bucyrus 2-1/3 yd. shovel att. only, 55B, 52B.

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

Frantz

We Guarantee this Equipment as Listed and Invite YOUR Inspection

GIVES CONDITION AND PRICE OF GOOD USED EQUIPMENT

EUCLID 9BV LOADER powered by General Motors diesel. Hitch for HD 20 tractor. New belt and spare parts included. This machine is in near new condition having moved less than 350,000 cy. material: Current price of this machine delivered in New Jersey with new belt is approximately $36,128.00

Our price $22,500.00 f.o.b. PREAKNESS, N. J. And we'll Rent for $2000.00 per month. If you need a loader it will pay you to inspect this one!

CATERPILLAR RD6 with Southwest Cable Dozer.
Working Condition (A dog).....$2,000

KOEHRING model 205 Cruiser crane (½ c.y.) with Chrysler gas engine and 40' boom; hydraulic steering; one man controls.
Rebuilt and Guaranteed.....$9,000

ALLIS CHALMERS HD 20G 4 c.y. front end loader. New 1952.
Good Operating Condition.....$20,000

4 WOOLDRIDGE TERRA COBRAS with 200 H.P. Cummins diesel engines; Fuller 2A112 transmissions—*all latest steering changeovers!* 24:00 x 24-24 ply tires in 80% condition.
Excellent Condition. BARGAIN PRICE $9500

ALLIS CHALMERS HD5B tractor with Gar Wood angledozer.
Rebuilt and Guaranteed.....$6000

ALLIS CHALMERS HD 19 with Carco cable bulldozer and front mounted winch.
Rebuilt Guaranteed.....$13,500

BYERES model 83C ¾ cy. SHOVEL BACKHOE with Buda model K428 motor.
Good Condition.....$7900

BUCKEYE 11' CHIP SPREADER with agitator.
$600

ALLIS CHALMERS HD9G tractor with Tractomotive 2 cy. front end loader.
Rebuilt and Guaranteed.....$14,500

JOY 105 COMPRESSOR used very little.
Good Condition.....$1800

GALION 101 MOTOR GRADER with International diesel; 12' blade.
A Good Buy.....$4500

2 GAR WOOD model 524 SCRAPERS front tires 18:00 x 24; rear tires 24:00 x 29. These machines are in good condition and are for rent @ $750. per month.
Rentals Apply to Option Price of...$10,000

ALLIS CHALMERS model D MOTOR GRADER with A-C gasoline engine.
Rebuilt and Guaranteed.....$4500.00

10 LE TOURNEAU SUPER C TOURNAPULLS with LP Scrapers & or W210 Rock Wagons, Cummins Diesels, 21:00 x 24 tires.
Good to Excellent Condition. $5000-6000 ea.

INTERNATIONAL TD9 with Bucyrus Erie Angledozer.
Good Condition but needs motor overhaul.....$2500

GALION TRENCH ROLLER with Wisconsin gas engine and hydraulic steering.
Near New Condition.....$3,900

ALLIS CHALMERS model D MOTOR GRADER with A-C gasoline engine.
Rebuilt and Guaranteed.....$4500

REX PUMPCRETE model 200 W. Double cylinder; agitator hopper with separate gasoline engine drive—mounted on top of machine. Several hundred feet 8" pipe & all fittings necessary to go right to work included.
Excellent condition, used on one small job.....$13,000

COMPLETE PAVING SPREAD: 34 E Dual Drum Pavers, Blaw Knox Spreaders, Finishers, Sub-Graders, Koehring Longitudinal Finishers. Equipment for 10 to 15 foot and 25 foot widths, and 7"-8"-9"-10" Blaw Knox Forms. Will sell or rent above individually or as a unit.

Equipment in Excellent Condition and Ready to Work
Subject to Prior Sale or Other Disposition

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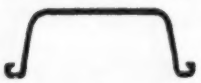

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DRAGLINE attachment for the above Marion shovel, 90' boom, 8½ yd. Hendrix drag bucket, LOCATION: Pickstown, South Dakota.

MARION walking dragline model 7200, diesel-electric, Ward-Leonard control, S/N 9072, w/120' boom, 8½ yd. Hendrix drag bucket, drag and hoist power Cleveland diesel engine model GM-8-278A 750 hp. at 720 RPM, driving motor-generator set, all driving motors and generators manufactured by GE Co., new in 1949 and used only two seasons. LOCATION: Crofton, Nebraska.

MARION dragline model 111-M w/Cummins L-6 diesel engine, 90' boom, 5 yd. Hendrix bucket, light plant, S/N 8289, major overhauled in 1953, LOCATION: Crofton, Nebraska.

MARION dragline model 111-M w/GM twin 6-71 diesel engine, electric swing, 70' boom, 5½ yd. Hendrix drag bucket and 90' boom w/4 yd. Hendrix bucket, light plant, S/N 8606, major overhauled in 1952, LOCATION: Pickstown, South Dakota.

SHOVEL attachments for the 2 Marion model 111-M drags, 3½ yd. dippers w/spare 4¼ yd. Esco dipper. LOCATION: Kansas City, Missouri.

BUCYRUS-ERIE model 54-B combination shovel and dragline, 50' drag boom, Buda diesel engine, light plant, S/N 69835, LOCATION: Crofton, Nebraska.

NORTHWEST model 95 dragline, S/N 13498, w/Murphy diesel and standard 60' boom w/2 - 10' extensions, major overhaul in 1953. LOCATION: Crofton, Nebraska.

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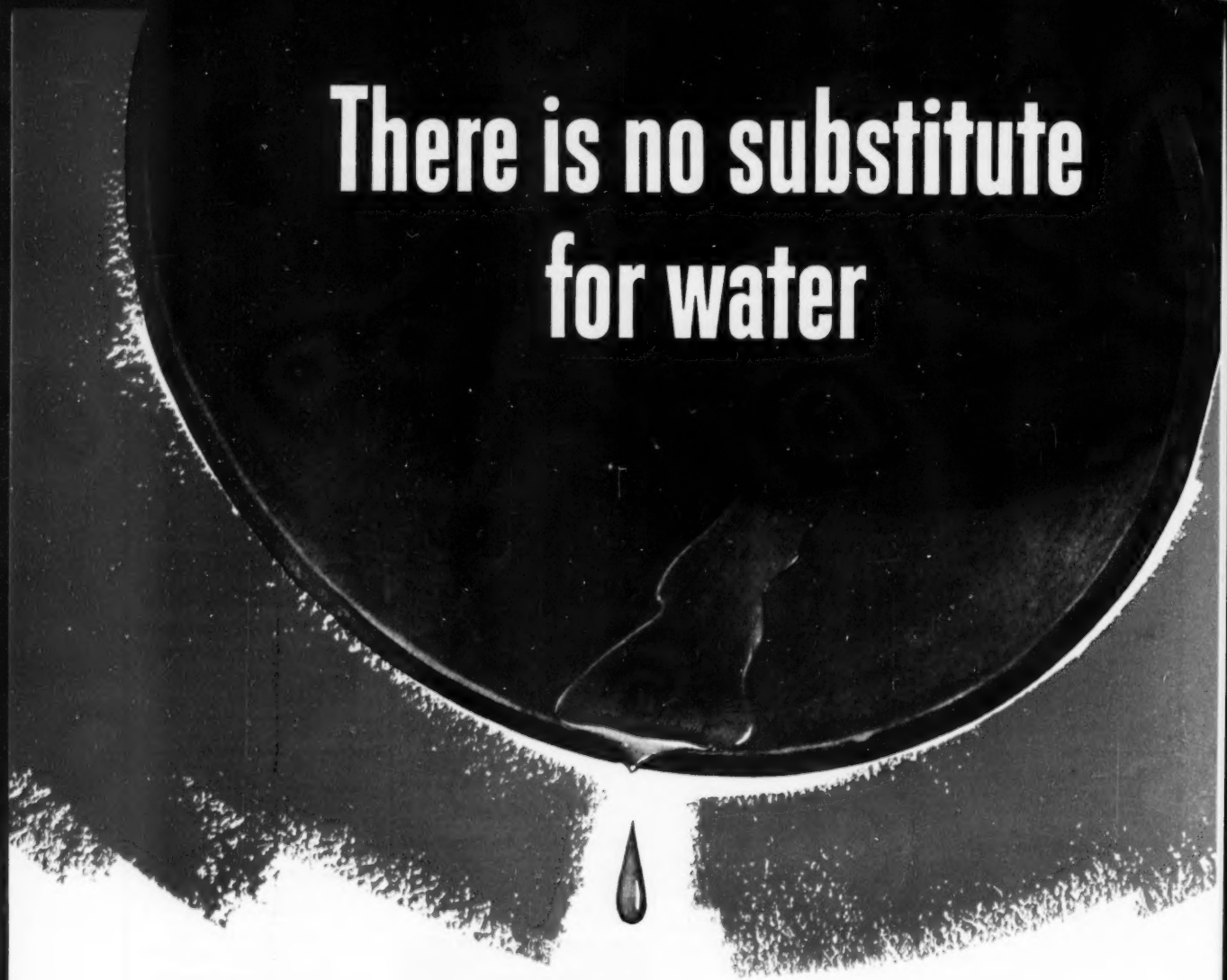

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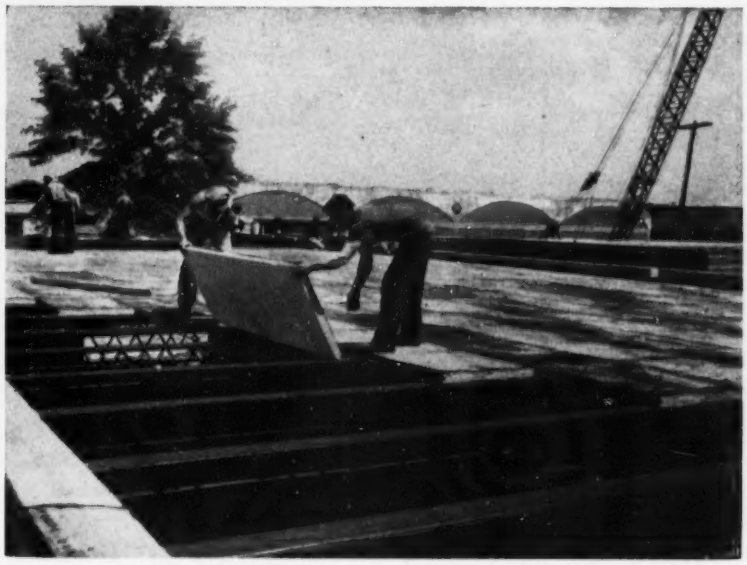

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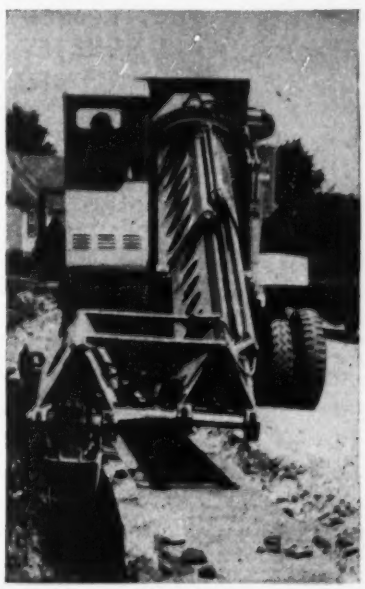

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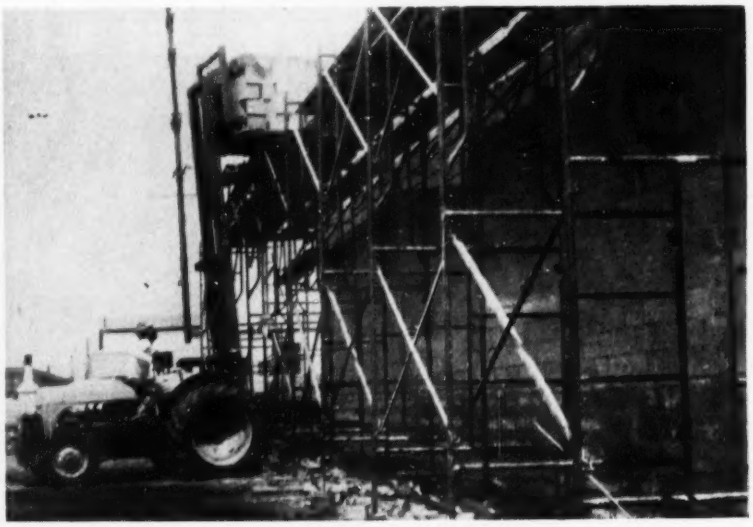


FOURTEEN-FOOT LIFT permits delivery of building blocks at scaffold level.

Material handling over rough ground eased with tractor-mounted fork lift

Attached to a Ford or Ferguson tractor, a new fork lift unit is said to be maneuverable over wet or sandy ground to deliver building materials from the truck or stockpile to the worker without time-consuming intermediate handling. On the job here, the masonry contractor estimated that he saved 20 per cent of his labor charge through the use of tractor and attachment. Further, the contractor's initial investment was 50 to 75 per cent less than if he had purchased a comparable model fork lift truck.

The Callahan fork lift attachment has a lifting capacity of 3,000 lbs at 24-in. load centers, and lifting heights are available from 6 to 14 ft. The 4-in. hydraulic hoisting ram is actuated by a 11.5-gpm Vickers pump driven off the tractor engine crankshaft.

Two 3-in. cylinders permit the tilting of the loading mast 17 deg forward and 9 deg backward. An optional side-shifter with an overall travel of 5 in. can be supplied for either factory or field installation. A load stabilizing clamp is also made available.

Outside turning circle of the tractor is about 16½ ft., and minimum underclearance is 10½ in.

The attachment weighs about 1,400 lbs and counterweights are available in 125 and 250-lb increments. The number of weights needed is determined by the weight of the load that is to be lifted.

If operations are such that reversed steering is desired, so that the operator is facing the load, a changeover kit may be had.

Once installed, the fork lift attachment may be removed in about an hour—leaving the tractor ready for operation in its original condition. CALLAHAN ENGINEERING CO., 2025 SACRAMENTO ST., LOS ANGELES 21, CALIF.

Reinforced polyester used for skylighting

30,000 sq ft of Plexolite, a Fiberglas-reinforced polyester sheeting, has recently been installed on a California warehouse. The tranluscent panels are a new entry in the widely expanding group of plastic skylighting materials.

The material is said to have provided not only perfect sealing qualities but also to have saved $100 to $150 per skylight for a total saving of $100,000. Sawing, drilling and nailing of the panels can be done with conventional tools and with spoilage kept to a minimum, it was reported.

Other advantages claimed for the plastic are that it is extremely light in weight, is shatterproof and is also resistant to fire, corrosion and mildew.

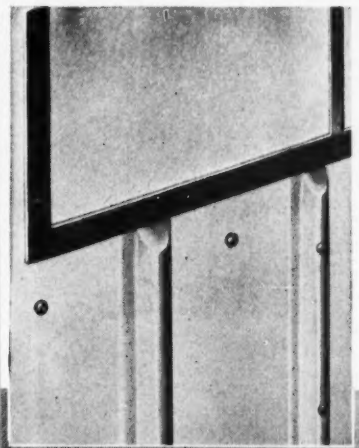
The panels are available in 12 colors and 27 standard sizes in various corrugations and flat sheets. PLEXOLITE SALES CO., 4223 W. JEFFERSON BLVD., LOS ANGELES 16, CALIF.

Another BUTLER *construction feature for better steel buildings*

WEATHER SEALED

Base and Windows

Closed corrugations at windows and base need no sealing or flashing.



A snug fit that keeps out driving rain, snow and dust around windows and at the building base is assured by Butler construction. Deep-formed corrugations in Butler galvanized steel or aluminum sheets are specially crimped to fit snugly against building base and window frames. Butler pre-engineering assures fast, easy, low-cost field erection—and also assures 100 percent re-use of materials for building expansion or removal to a new location.

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- Clear span, rigid frame construction
- Deep-drawn corrugated sheets, galvanized or aluminum
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- Die-formed one-piece roof ridge
- Weather-sealed windows and base
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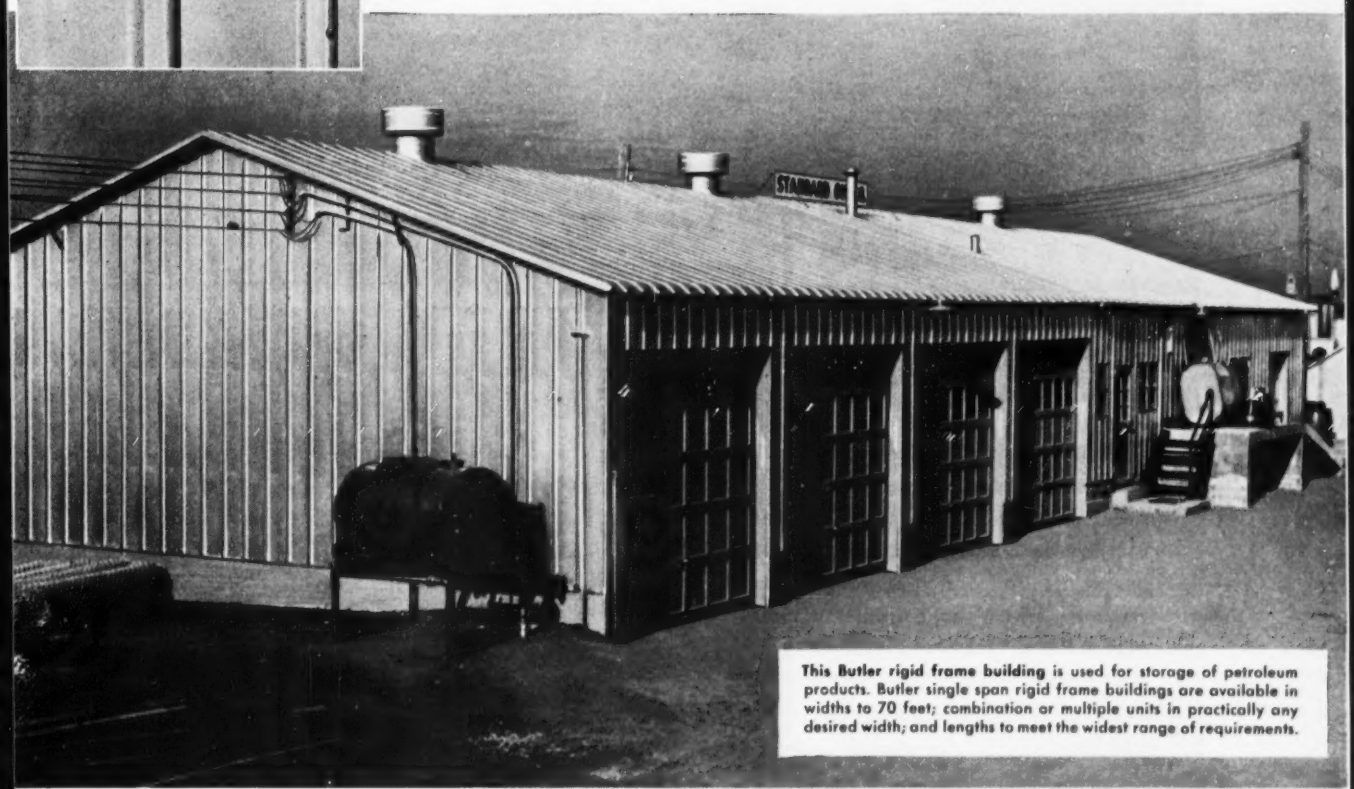
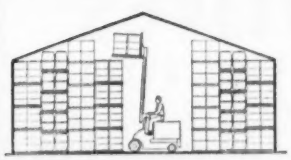
- Sidewall sheets mitered for weathertight fit with eave sheets
- Weathertight stationary ventilators
- Easily insulated
- Complete adaptability to your door and window requirements



This Butler rigid frame building is used for storage of petroleum products. Butler single span rigid frame buildings are available in widths to 70 feet; combination or multiple units in practically any desired width; and lengths to meet the widest range of requirements.



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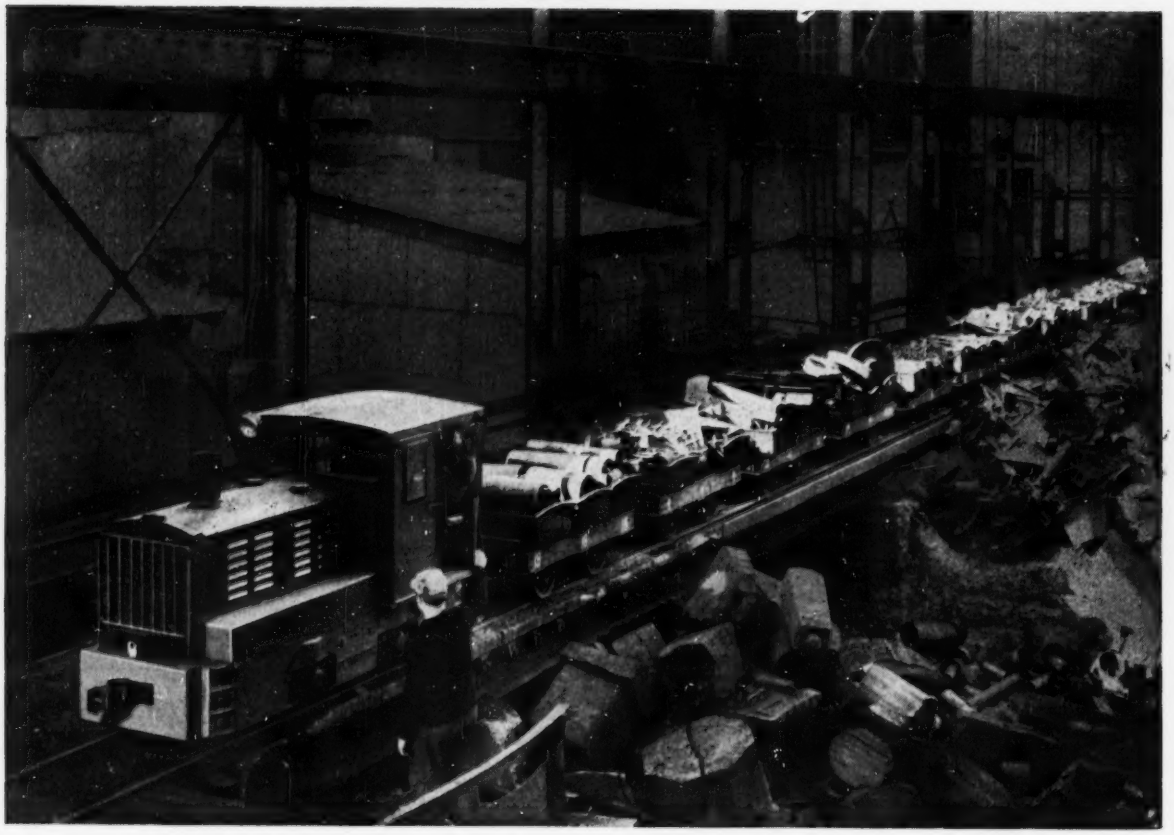

This PLYMOUTH Cuts Costs

in steel mill operation

This 10-ton narrow-gauge Plymouth works three shifts a day hauling scrap steel to open hearth furnaces at the Heppenstall Company in Pittsburgh. The owners praise its smooth, steady power, its freedom from jerky starts—big advantages which result from Plymouth's Torqomotive Drive.* Ease of operation keeps Heppenstall operators fresh and efficient, and what's more the company's records show that hauling jobs get done quickly and at rock-bottom cost!

To find out how you can get maximum efficiency in your hauling and switching operations, write for complete information on Plymouth's narrow and standard gauge locomotives. Models range from 3 to 70 tons, gasoline and Diesel-mechanical, gasoline and Diesel-Torqomotive, or Diesel-electric drive. Address: PLYMOUTH LOCOMOTIVE WORKS, Dept. A-4, Plymouth, Ohio.

*Torqomotive Drive: Plymouth transmission with hydraulic torque converter

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ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY

Conveyor terminology adds a new word—Guidler

The Guidler—the name is a combination of its functions as a guide and an idler—is a spool-like affair designed to be mounted at the edges of conveyor belts. When properly installed at an angle 30 deg from vertical, the Guidler presents a revolving hyperbolic face to the belt edge. The importance of this motion and design is that the force of the impact is thus distributed over a relatively long, flat surface, and injury to the belt is minimized. The Guidler also moves along its own axis and thus follows the vertical movements of the belt edge and controls it while rising.

Three types of Guidlers are currently being produced. These are said to cover practically every belt guide problem. KNAPP MILLS INC., 23-15 BORDEN AVE., LONG ISLAND CITY, N. Y.

1800 tornadoes per minute explodeed under the hood

If what they think happens does happen, Mack engineers have created a tornado manufacturing machine in the new END 673 diesel. The secret is the piston design and the reason is to provide improved combustion.

Formed entirely in the piston crown, the combustion chamber is semi-toroidal in shape, with an essentially flat cylinder head surface. The design of the intake port imparts a tangential direction of flow to the incoming air with a resulting swirling movement in the combustion chamber. As the piston head rises, the

AFTER ONE HOUR OF IMMERSION clay cylinders demonstrate the effectiveness of Dow-Corning XS-1 silicone solution as a water repellant. The treated cylinder at left is still intact whereas the crumbled mass to the right represents the remains of a similar but untreated sample. XS-1 shows promise as a treatment to help soils retain a high wet strength. Tests indicate that treatment with XS-1 will accelerate water drain-off, reduce seepage into a roadbed and thereby minimize road maintenance. Dilute solutions of the silicone can be applied by spraying, brushing, immersing or mixing. Dow-Corning Corp., Midland, Mich.

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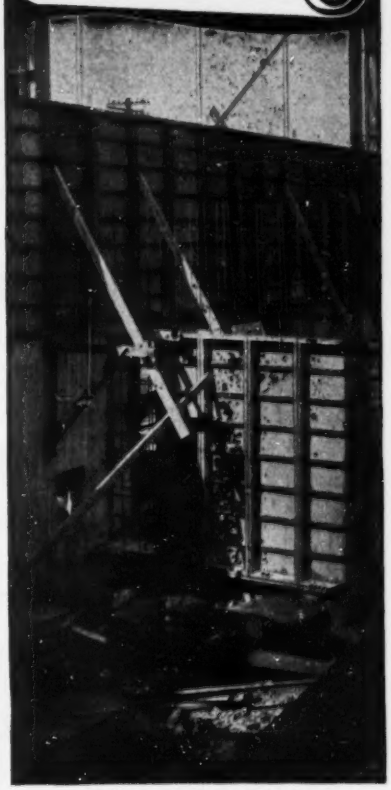

Finkl Forged Products Co., Chicago
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semitoroidal shape of the piston crown presumably accelerates the swirling air into a vortex traveling at tremendous speeds. This vortex is thought to disseminate injected fuel throughout the combustion chamber quickly and efficiency and thus assure rapid, complete combustion.

Mack says that in addition to affording complete combustion, the new combustion chamber assures more efficient cooling of the injection nozzle through reduced heat concentration in the piston head. The final result, they say, is more miles per gallon and easier starting.

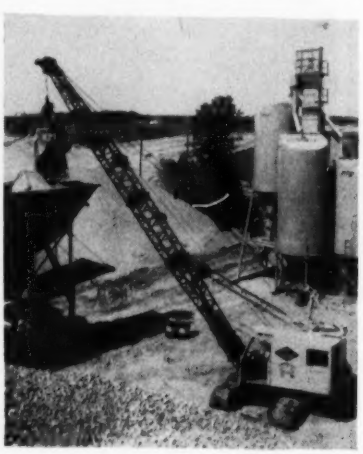
The Mack END 673 replaces the END 672 in the manufacturer's line. Gross brake horsepower has been boosted from 165 to 170 bhp at 2100 rpm, and maximum torque against a governor has been increased from 405, to 425-lb-ft. In addition the compression ratio has been upped to 16.59:1.

The engine has been developed specifically for installation in Mack vehicles. TRUCKING INFORMATION SERVICE, MACK TRUCKS, INC., 350 FIFTH AVE., NEW YORK 1, N. Y.

Weight cut on new 25-ton capacity crane

Weight on the new Lima Type 44 crane/shovel has been kept to a minimum by placing the main machinery and power plant well to the rear of the centerline of rotation. It is said that this arrangement develops a maximum counterbalancing effect and effects the greatest capacities per pound.

The crawler track frame consists of two structural H-beams welded integral with the side frames to form the



RELOCATION of upper machinery permits reduction of counterbalance weight required.

support for the truck base casting. The four front rollers are mounted in tandem on equalizer beams and the two rear rollers are mounted on rigid supports. This system reportedly provides for an equal distribution of weight on a larger area of the twin roller paths. The standard crawler is 12 ft 3 in. long with 30-in. tread pads; however, a 15-ft long crawler can be furnished for crane, dragline or clamshell operations requiring greater bearing area.

As a shovel, the Type 44 is equipped with a 20-ft boom and 18-ft dipper handle. Crane booms are available up to and including 100 ft, less jib. 15, 20 and 30-ft jibs are available. The machine has a capacity of 1 cu yd as a shovel and 25 tons as a crane.

Anti-friction bearings are utilized in high speed shafts and main hoist drums.

Torque converter for the Type 44 is optional. BALDWIN-LIMA-HAMILTON CORP., CONSTRUCTION EQUIPMENT DIV., LIMA, OHIO.

Hand-drill converts to thrust-action saw

A cam-action saw has been developed to convert the rotary power of an electric drill to a thrust-action saw without the use of gears.

The tool is attached to any heavy duty electric drill for cutting metal, plaster, transite, nails, lath, plastic or other material. Each revolution of the power drill is turned into a $\frac{7}{8}$-in. stroke by the cam action of the saw.

Specially designed blades eliminate starting holes, but the saw's universal chuck permits the use of standard makes of hack and key-hole saw blades.

Built of cast aluminum and alloy steel wearing parts the attachment weighs only $3\frac{1}{4}$ lbs. An adjustable guide handle allows the tool to be used in otherwise inaccessible spots. E-Z WAY TOOL CO., BARRINGTON, ILL.

Ice removing chemical boasts high thawing rate

Known as X-73 Ice Remover, a new chemical product is reputed to melt ice and snow many times faster than salt. The chemical is available in coarse granules and is applied in much the same manner as rock salt, but, according to the manufacturer, X-73 spreads itself thoroughly during the melting process.

The ice remover contains a rust inhibitor to protect vehicles, drains and gutters. It is available in 100 and 200-lb bags and drums. THE MONROE CO., INC., 10703 QUEBEC AVE., CLEVELAND 6, OHIO.

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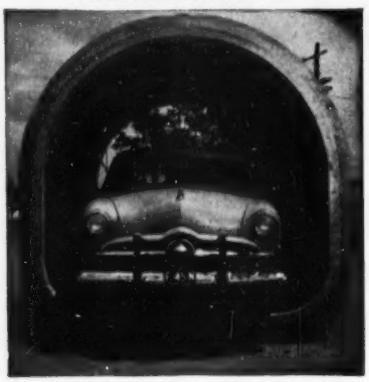

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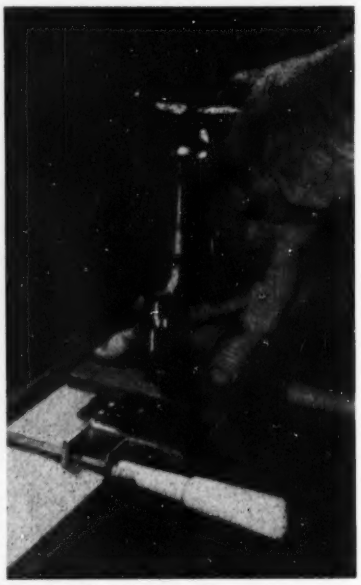


MORTISING TOOL fits any ¼-in. drill.

Butt marker and mortiser eliminates guesswork

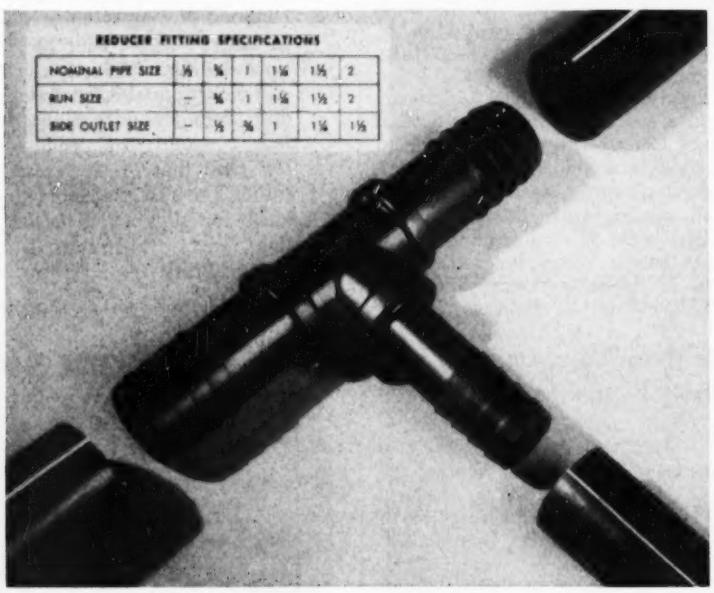
The Gohm mortising tool is constructed to fit any ¼-in. electric drill. According to the manufacturers, the tool is simple to operate and can be used to mortise doors and jambs for a five-room house in less than one hour. No templets are required with the tool.

The butt marker marks position for all butts on doors and jambs in one operation. The marker can be folded to fit into any standard tool box. It is said that guesswork and adjustments are completely eliminated through the use of this tool. KNIGHT MFG. CO., 914 CITIZENS BANK BLDG., FLINT 3, MICH.

Siliconed roof coating remains elastic longer

Addition of silicones to Rufferseal roof coating is reported to preserve the elasticity and durability of the standard roof coating over longer periods of time. Further, the combination of silicones with long-fiber asbestos, asphalt and non-volatile waterproofing oils is said to produce a roof coating that offers greater resistance of oxidation. Other advantages noted are freedom from checking, cracking and sagging.

The material is applied cold and can be brushed or sprayed on as either new roof coating or for repairs. THE MONROE CO., INC., 10703 QUEBEC AVE., CLEVELAND, OHIO.



PLASTIC REDUCER TEE facilitates installation of step down laterals for plastic water lines, sprinkler systems and other applications where such laterals are required. The side outlet of the tee is one size smaller than the run, and the new fitting is available in run sizes up to two inches. Joining of the tee is done in the same manner as used for standard plastic insert couplings. Carlon Products Corp., 10225 Meech Ave., Cleveland 5, Ohio.

PUBLICATIONS

Welding electrodes—A new 8-page technical bulletin deals with recent technical developments in the low hydrogen electrode field. The booklet entitled "The Facts About Low Hydrogen Electrodes" contains chapters devoted to history of this type of electrode, effects of hydrogen, effects of the basic slag, control of hydrogen, welding procedures and applications. Bulletin AR53-18. ALLOY RODS COMPANY, YORK, PENNSYLVANIA.

Dump bodies—A new 8-page descriptive catalog tells the complete story of a line of heavy duty dump bodies and hoists for on and off highway service manufactured by St. Paul Hydraulic Hoist. Included in the literature is the regular St. Paul line of heavy duty under body arm-type hoists as well as its Hi-Dumper hoists together with a complete complement of dump bodies. Five models of single cylinder and double cylinder hoists in the conventional line offer capacities from 8 to 27½ tons. ST. PAUL HYDRAULIC HOIST, CUSTOMER SERVICE DEPARTMENT, WAYNE, MICHIGAN.

Dry brick walls—"Specifications Recommended to Secure Dry Brick Walls"—an award winner in the 1953 Building Products Literature Competition—sets forth and explains the significant facts obtained in 20 years of research, carried on to determine how water can be prevented from passing through brick walls. Included are recommendations for certain precautions that should be included in the architects' specifications. DEPT. H. M., LOUISVLLE CEMENT COMPANY, LOUISVILLE, KY.

Water and sewage treatment—A 24-page illustrated brochure outlines the uses of Pittchlor for water, sewage treatment and general sanitation purposes. The publication sets forth the advantages Pittchlor offers to municipalities and also carries tables of solution strengths for a wide range of applications. COLUMBIA-SOUTHERN CHEMICAL CORPORATION, 420 FORT DUQUESNE BOULEVARD, PITTSBURGH 22, PENNSYLVANIA.

Hose care—A new bulletin tells what to do and what not to do in the use and storage of various kinds of hose, including fire, steam, oil, water, air, suction and sandblast hose. The bulletin entitled "Tips on Hose Care" is available from HEWITT-ROBINS INC., 240 KENSINGTON AVE., BUFFALO, N. Y.

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EDITORIALS

Holiday safety

HIGHWAY DEPARTMENTS of states, counties and cities can make a major contribution to highway safety during the forthcoming Labor Day weekend by eliminating all possible traffic hazards on and around construction projects. If a little extra pushing will complete a job, the additional expense would be well justified. If temporary facilities or detours are required, every effort should be made to smooth and sign the way.

And if construction operations have to be suspended early, that, too, should be considered in the light of greater protection for the traveling public.

"Road Under Construction, Travel at Your Own Risk" may signal the danger ahead to the seasoned driver, but such warnings may be taken lightly by the occasional motorist bent on his holiday journey. Consequently, there should be early and adequate planning for safeguarding motorists from the confusion and unnecessary driving hazards often encountered on highway construction projects. And it should start with top management of highway departments and contractor organizations and extend on down to the very last man on the job who can contribute anything to safety.

Reservoirs vs floodways

USE OF RESERVOIRS as the framework around which to build a system of flood control for large river systems is rejected as ineffective and needlessly costly in the final report of a board of engineers set up by the state of Kansas to report on how to avoid such vast damage as was done by the 1951 flood in the Kansas River (see p.53). The report is thus a direct challenge to the soundness of the engineering thinking that the Army Engineers have applied to their planning for flood control on many of the major river systems of this country. Only on the lower Mississippi have the Army Engineers applied principles similar to those laid down by the Kansas board of engineers.

For the Kansas River, the Army Engineers propose construction of 36 reservoirs and an extensive system of levees and floodwalls. This they maintain would protect both urban and rural lands in the valley from overflow in a major flood, at a cost of $700 million.

The Kansas board of engineers would provide no protection for rural areas from overflow in a major flood. Protection for urban areas would be provided by levees or walls and by enlarging the flood channel of the river so that it could pass a flood equal to that of 1951 without overtopping the setback levees and floodwalls. Present encroachment on the flood channel would be eliminated and new encroachments prevented by zoning. In defense of its proposal to let the waters of major floods submerge farm lands in the valley, the board says that those lands benefit from an occasional flooding, and that the cost of keeping high floods off them exceeds their value. The cost of work proposed by the board is set at $200 million.

In these findings the Army Engineers are faced with a challenge that cannot be avoided. They must come up with a strong defense of their plans or risk having a powerful local group such as the recently organized Kaw Valley Flood Committee go to Congress asking for support for a new flood-control plan that will cost the federal government very much less than the amount that the Army Engineers must seek to complete their project. An economy-minded Congress could be expected to be receptive to such a proposal even though it called for some changes in flood-control policies.

What the Army Engineers think of this report is known in general terms, as some of the engineers directly concerned commented unofficially on the board's preliminary findings last spring. They question the economic justification for subjecting rural lands to periodic overflow and doubt that such a plan will meet with public approval. They characterize the $200-million cost figure of the board as unrealistic.

The Army Engineers hold that the higher velocities inherent in the board's plan would result in destructive erosion and that dumping a flood of the magnitude of that of 1951 into the Missouri at the rate called for by the board's plan would require costly revisions in flood-protection works along that river. Also, they note that their plan will provide complete protection to both rural and urban lands against a flood greater than that of 1951, which magnitude is possible according to Army Engineer calculations.

On the major issue of reservoirs for control of floods on large river systems, the Army Engineers cite what has already been done on the Ohio in support of their plans for many reservoirs on the Kansas River.

At the present moment it appears probable that a final decision as to what plan will be adopted will center on this question of how effective reservoirs can be on the Kansas River and on the effect of higher discharges from the Kansas on protective works for the Missouri. On the reservoir question, the Army Engineers of today are in the embarrassing position of having a report written by their predecessors in 1904 turn down reservoirs as a means for controlling floods on the Kansas River. And quite recently, the Missouri Basin Survey Committee made a similar finding.

How a final decision is to be reached, of course, is unknown at this time. We hope it will be made by an engineering board of review set up by Congress. The weakness of a finding made by a board set up by any lesser or unofficial agency, such as the Kaw Valley Flood Committee, is that its finding would not carry the weight with Congress that would be accorded to the findings of a board created by Congress itself.

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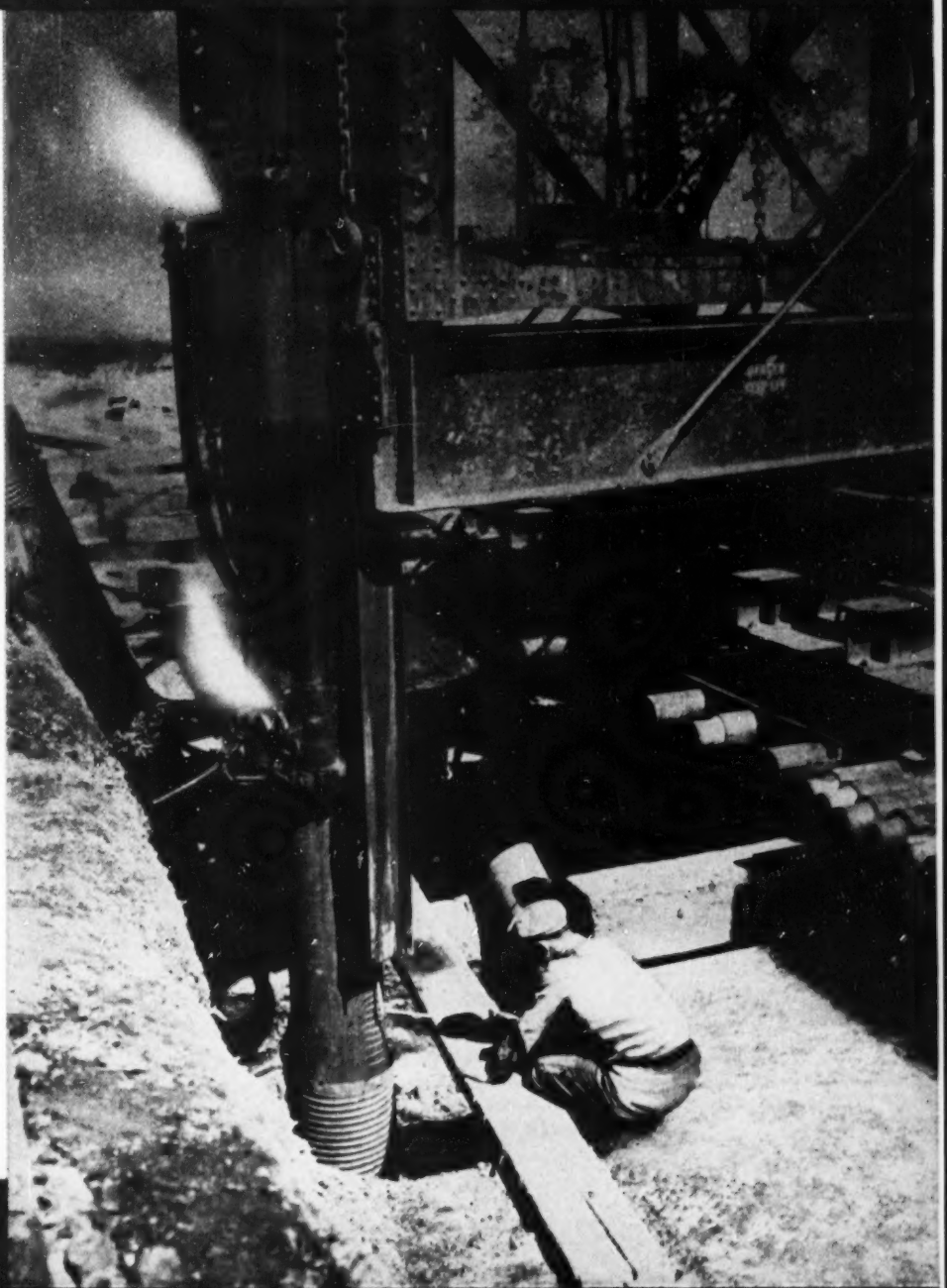

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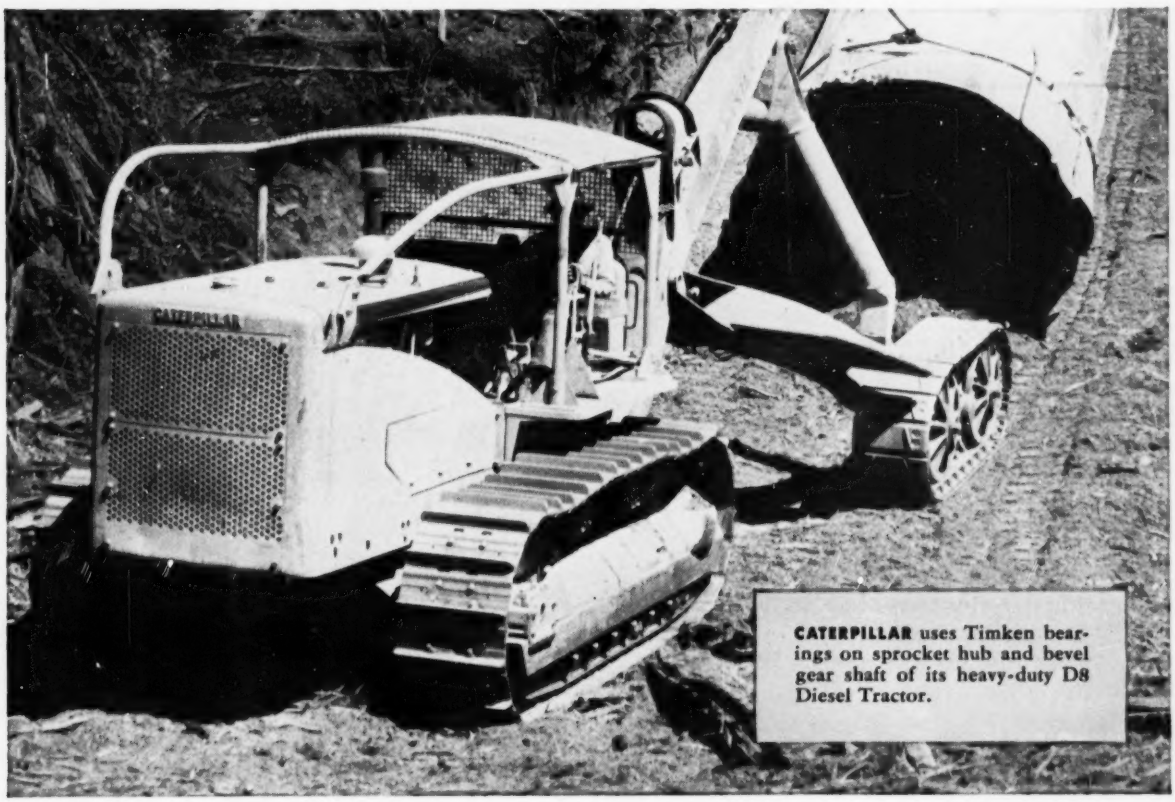

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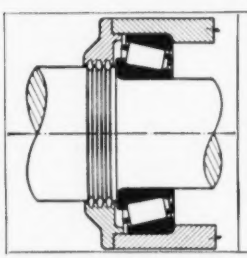

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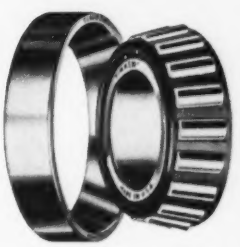

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